NATURE MAGAZINE

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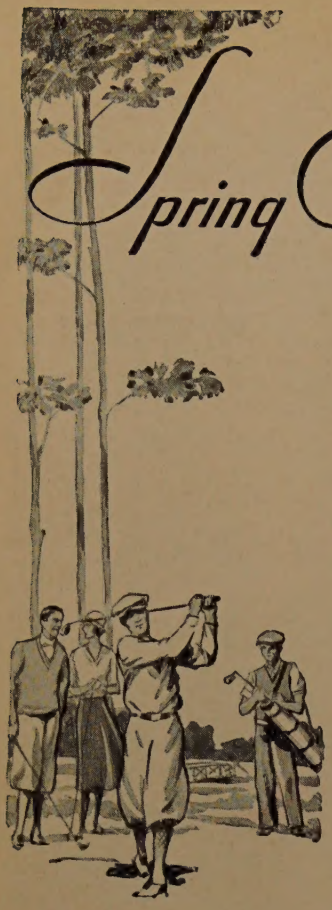

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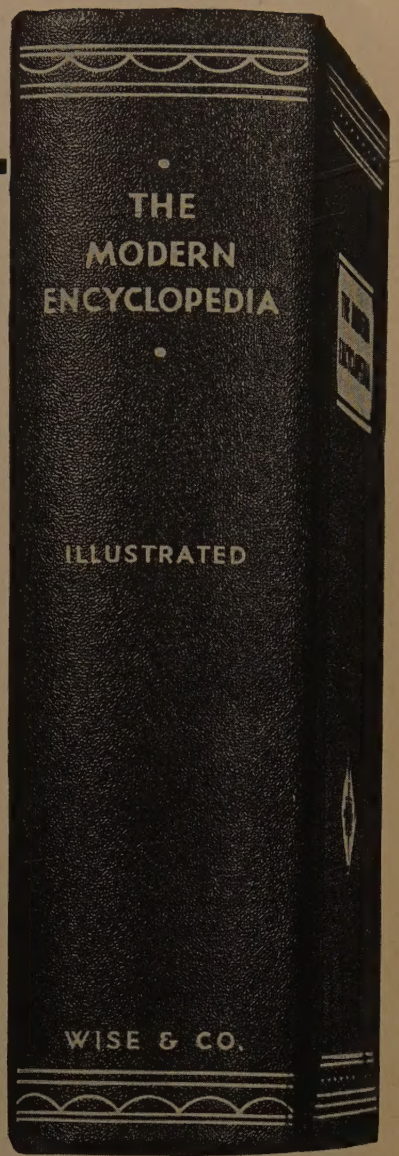

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ARE YOU GOING TO CAMP?

BY J. HALSEY GULICK
DIRECTOR LUTHER GULICK CAMPS

If you go to camp this summer you may learn how to use an axe, paddle a canoe, swim, dive, aqua-plane, ride horseback, make primitive jewelry, weave, paint, dance, sail, sleep out in the open, make a canoe shelter, build shacks and tree houses, fly a kite and you may even learn how to sing. You may be dreaming of these things right now and possibly you are counting the days on the calendar before they will be within your reach. Any live boy or girl would enjoy being in camp where these and other activities were presented.

Right now you may be dreaming of what you want to do first but what do you suppose you will take home that will be of more permanent value to you than anything else? Will you take great pride in your diving, will you show your parents the results of your craft work, or do you think you will boast about your ability to sleep in the open? Naturally you will have considerable pride in the actual ability to do any of these things but there is something you will gain of far more importance and many camp boys and girls will immediately recognize what I have in mind.

One of my tent mates years ago came to camp as a pampered, selfish, and babyish sort of kid. He would cry at the least provocation and would throw everything from his shoes to his wet bathing suit when these fits of temper started. As the weeks went by he made some remarkable changes in his behavior and at the same time he learned to swim and participate in many of the camp activities. This first summer at camp was the turning point in his life. Many years later he left Exeter, president of his class and captain of two major athletic teams. The biggest baby in camp became president of his class at Exeter.

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So if you are going to camp I hope you will dream about all the things you are going to do. At the end of the summer you may have absorbed intangible qualities which will be of more lasting benefit to you but these will only be acquired if you enter into the various camp activities wholeheartedly.

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Ants at Work

By George Y. Worthington

While idling away the late afternoon last winter in Florida, I was seated on the patio of my apartment house, when my attention was attracted by numerous tiny ants scooting hither and yon across the tiling at my feet. Their speed amazed me and I longed for some method of computing it. They were so small that it was a real strain upon my eyesight to see any particular ant. I verily believe one of them could easily turn around in a ring the size of the capital "O" used in ordinary newspapers. Much interested, I watched them closely, being curious to know the important business that caused such haste. I discovered that their nest was located under a large tub containing a good-sized palm and that their mission was to find food to be transported to the home store. A hole no larger than any ordinary lead pencil afforded an entrance.

Later, I noticed a dead candle-moth of medium size lying on the tiled floor some eight feet distant from the tub, but at the time I did not associate the tiny insects running about my feet with the dead moth as a possible food supply. My gaze wandered away to the flowers and foliage lining the other side of the patio and for the moment I forgot the ants and the moth—not for long, however, as my shifting gaze was sharply arrested by an apparent movement of the dead moth across the tiling in the direction of the tub, a closer view established the fact that the body was moving at a slow speed and sideways at that. At first I was sorely puzzled, as the moth was certainly dead and no motive power was visible, yet it was slowly and steadily lessening the distance to the tub; then I remembered the little insects I had been watching and I was fascinated by the colossal strength exhibited by the group that must be under and propelling the moth—a bulk I should say equal to several hundred of the ants. First they must raise the body from the floor and then carry it onward without a single pause, and the body was finally landed in front of the hole in the tub—still sideways.

After a time it moved partly around and was carried towards the entrance, but alas, the outspread of wings covered the hole and prevented entrance. Then it was, and for the first time, two little specks on the back of the moth appeared and moved about. Evidently at their command the body was moved away an inch or so and then deliberately reversed so that the head would face the hole. How disappointed these little workers must have felt when they discovered that the body could not be forced through the inadequate opening! My sympathy for them suggested a dismemberment but before I could come to their aid a new order had evidently been issued for almost immediately the moth began to move again—this time around the tub where, undoubtedly, there might be a larger opening. They had almost disappeared when I was called away, so I cannot say whether or not their industrious efforts were duly rewarded—I can only hope that they succeeded for the moth's body was not in view the next morning and there had been no wind during the night. Learn from the ant thou sluggard or dull-witted!

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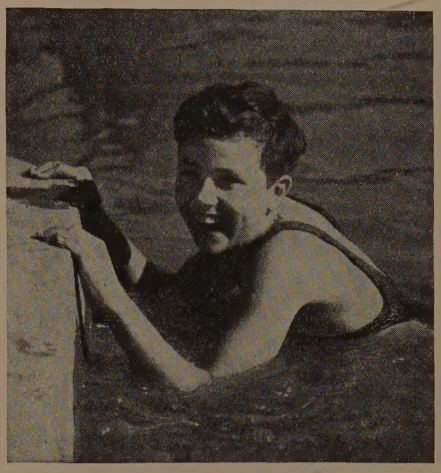

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THE PATIENT MOTHER BIRD IS PHOTOGRAPHED ON HER NEST

•

AN APPARATUS FOR WILD LIFE PHOTOGRAPHY

By Walter P. Benter

For several years, various birds have been building nests in the vines around our porch and, as is natural for anyone with a camera, we wished to take close-up views of both birds and nests.

The old method of running a thread from the shutter to a distant point was not satisfactory as it meant that the camera must be clamped or held rigid to prevent movement when the thread was pulled. Also, some of the positions in which we had to place the camera made rigidity difficult. Another objection to running a thread to the shutter was the fact that the bird on the nest changed its expression as the thread moved in taking up its slack. We needed something instantaneous and easier to operate.

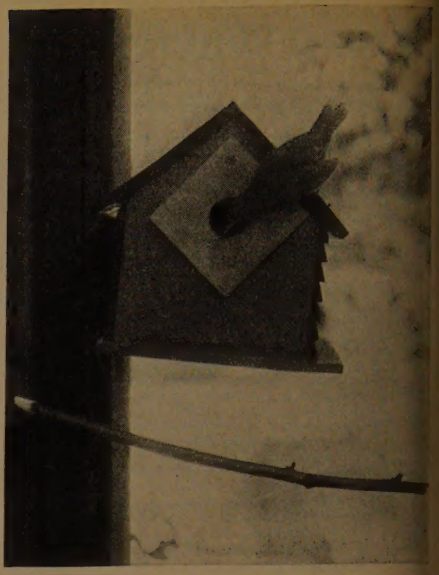
The apparatus we made worked on the principle of the "Sucking Solenoid". If electric current is passed through a hollow coil of wire and a nail or iron rod is placed near the hollow core, it will be pulled into the center of the coil. The extent of movement of the nail depends on the length of the coil and the pulling strength depends on the size of wire, number of turns and the current applied.

A diagram of the apparatus we made is shown in the drawn figure. A hollow spool was made of a piece of ¼" brass tubing about 1½" long with 1¼" brass washers soldered to the ends. This was wound with about 250 turns of thin insulated wire (about No. 28) thus making a coil approximately 1½" long, 1¼" diameter with a ¼" hole through the center. The ends of the wires extended out from one side of the coil, which was fastened upright on a small piece of fiber board. Two binding posts were bolted to the board and connected with the wires from the coil. When in use the board is clamped to the camera board with an ordinary spring paper clamp.

A core was made from a 1" length of nail large enough in diameter nearly to fill the coil center. A small ring was soldered to the end of the core by which it was fastened to the camera shutter with a short string or wire. The length of string or wire must be determined by experiment, as it depends on the type of camera used.

For power, we used a toy electric train transformer by which the current could be varied to the amount necessary to trip the shutter quickly. A portable push-button was connected with a long extension cord in series with the coil.

The set-up is shown in figure 2 and is self-explanatory. When the button is pushed, the shutter snaps instantaneously without any preliminary warning to the subject. Also, one need not stay tense holding a string while waiting for the subject to pose as the button can be held in the hand conveniently while one moves about if desired.



SNAPPED BY THE CAMERA JUST ABOUT TO ENTER ITS HOME

•

In the apparatus described, no special care need be taken as to how it is made, because the current from the transformer can be varied to take care of all electrical factors. Also, the distance from subject to photographer may be any distance whatever, depending only on the length of extension wire that is used.

Have a Camera Handy

Below is an excellent instance of the type of picture one often wishes one had taken, and would have if the camera had not been left at home. One of the joys of travelling lies in bringing back records of odd things such as the peculiar pitchfork shape of this dead tree along an Oregon highway. The photograph was made by Bessie C. Blay of Crescent, Oregon.

FIG. 1.

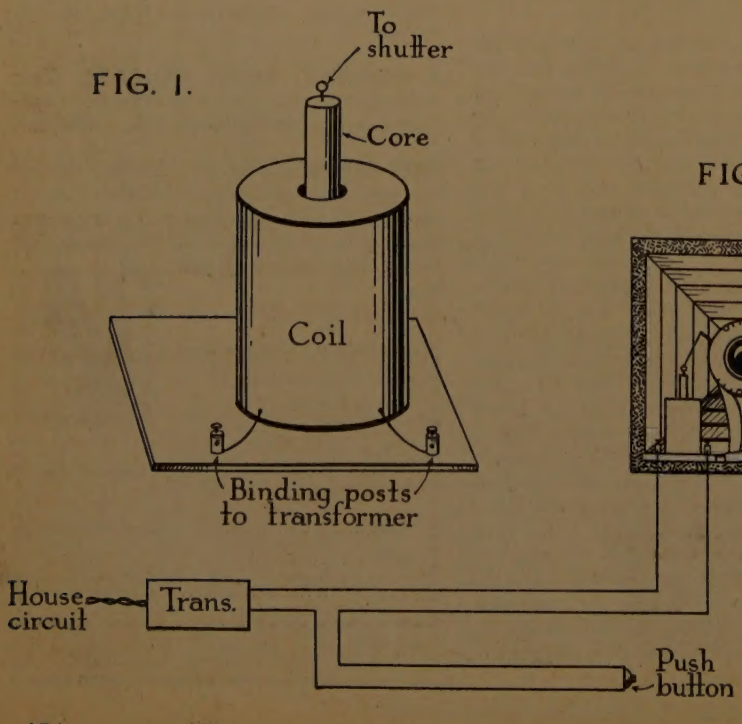


FIG. 2.

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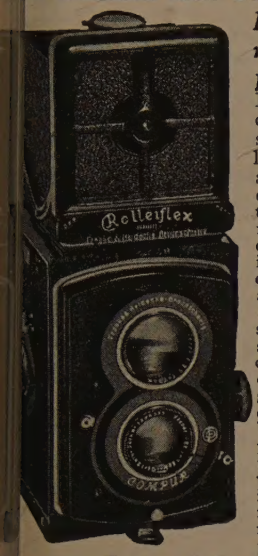

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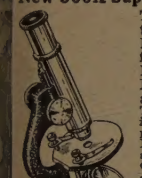

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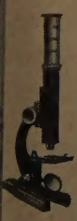

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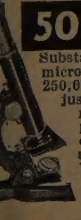

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THE "GRANT ROSE"

Recently, when going over some old papers, Mrs. I. W. Faulks of East Orange, New Jersey, came across an interesting old clipping. Just when it was published is not known, but judging from the type in part of an advertisement on the back it goes back some forty or fifty years at least. The clipping is apparently a reprint in a Michigan newspaper of a piece of correspondence written by the Live Oak, Florida, correspondent of the *Atlanta Constitution*. We reprint this story here and, while we may be perpetuating a myth, possibly someone has heard of the story and the flower about which it centers. Here is what the clipping says:

"In the western part of Jefferson County, Fla., there grows and blossoms into curious and magnificent beauty a rose that seems to be indigenous to a small area of country, but which will not flourish in other latitudes. The bush is a strong and vigorous one, and the leaves are a very light but glossy green. The petals of the flower curve slightly inward and are the color of a bright arterial blood. The odor is pungent, but slightly sickening. The peculiarity of this flower is that the dew that drops therefrom is of a faint pinkish cast, a marvel seen in no other flower, the baffling wonder of those who have witnessed it. It is called the Grant Rose, and has a sad and melancholy history. Its origin is one of those mysteries with which nature at times delights to astonish her devotees.

"In 1834 John Grant and Nellie Lowry were married. After a happy year of married life they and their baby were murdered by Osceola's Seminoles. A few years later a passing hunter, one of the original party that had found the bodies, happened on the same locality, and in the little hollow where the blood had gathered he saw a vigorous bush, bearing such roses as I have described. He cut some slips from it and took them to the settlement, where he related his discovery. Such a romantic and singular story excited the curiosity of many in the adjacent counties, and repeated efforts were made to secure the growth of the slips in other places, but they have all failed of success. Within an area of five miles, where the doleful tragedy occurred, it is said that the rose can still be found, with its strong and sturdy stalk, its pale-green leaves, its incurved crimson petals, and its bloody dew."

On Dragonflies

Entomologists and students will welcome the publication of *A Contribution to the Knowledge of Florida Odonata* by Dr. C. Francis Byers of the University of Florida. This is a book of more than three hundred pages, published by the University at Gainesville and selling for one dollar.

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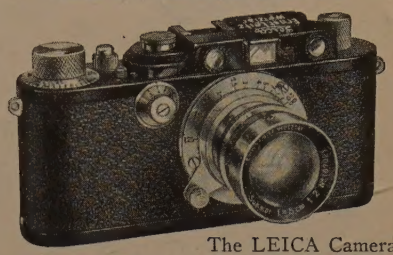

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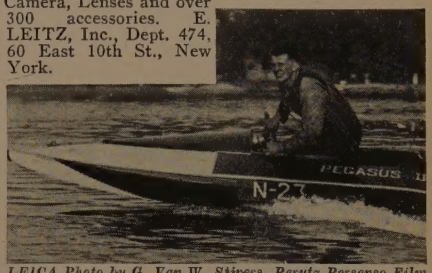

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THE PRESIDENT'S COMMITTEE ON WILD LIFE RESTORATION

• • •

OUR wild life species that are generally classed as game, with few exceptions, are rapidly disappearing. Those who have given thought to the matter, whether arrayed on the side of saving or of spending, are well aware of this fact. Many causes have contributed to this decline and various plans for arresting it have been proposed, but the decrease continues. We believe that the outstanding reason has been the unwillingness of the spenders to restrict their destructive activities. We cannot here enumerate the many plans, each designed to conserve our wild life, that have arisen within the past decade or so, but will discuss briefly the latest one proposed.

On January 2, 1934, the Secretary of Agriculture announced the appointment of a committee of three to outline a course of action under a plan to enlarge and improve areas suitable for the breeding of migratory and upland game birds. The personnel of the committee follows: Thomas H. Beck, Editorial Director of *Collier's*, Chairman; J. N. Darling, newspaper cartoonist, Des Moines, Iowa; Aldo Leopold, University of Wisconsin, Madison, Wisconsin. The two last mentioned are conservationists of national reputation; the chairman has headed the Connecticut State Board of Fisheries and Game since 1931.

Prominent features of the program include plans for acquiring, improving, and managing, in such a way as to increase the production of game species, some of the marginal lands to be retired from unprofitable crop production. The committee has been active since early January, but we understand that one member, Mr. Leopold, has been able to attend only a few of the sessions. A report, issued in multigraphed form on February 8, under the title, "Report of the President's Committee on Wild Life Restoration" (also issued in printed form about February 23 by the Government Printing Office), makes recommendations under five headings: Migratory Waterfowl and Shorebirds; Upland Game; Song, Insectivorous and Migratory Birds; Mammals, including Big Game and Fur-bearers; a new administrative set-up to insure business-like execution of the plan for wild life restoration. Lack of space will allow discussion of only two features of the report: the sections relating to waterfowl restoration; and the setting up of a new administrative unit.

The present report is somewhat reminiscent of one issued by "More Game Birds in America" in August, 1931, subsequently reissued with slight changes. Its title is "More Game Birds by Assisting Nature." Both this and the Beck report admit a serious shortage of waterfowl, and both studiously avoid mentioning overshooting as a factor in producing the shortage. Both lay special emphasis on improving breeding grounds, but here the details differ radically. The More Game Birds report recognized that at least seventy-five per cent (we believe that the correct figure is nearer eighty-five per cent) of North American waterfowl are raised north of the United States, and proposes some improvement work in Canada. The Beck report makes no mention of any breeding ground except in the United States. Since United States relief funds are depended on to finance the work, the fact that they cannot be expended in Canada might justify any lack of mention of this important factor. But we cannot understand how operations involving only a fraction of fifteen per cent of the breeding area can justify such extraordinary claims to benefit. Frankly, we feel that a genuine interest in waterfowl recovery would demand that some consideration be given to the nursery that now produces eighty-five per cent of the birds. The Biological Survey, whose long and extensive study of North American waterfowl demands respect for its findings, stresses the fact that drastic limitation of the annual kill, so that a sufficient breeding stock may be returned to the Canadian nesting grounds, now constitutes the most important service that can be rendered this gravely threatened resource. Yet in the Beck report, we find no reference to this important factor unless it be in this passage: "Natural propagation has been curtailed to such an extent that no amount of further restriction of the take or methods of taking will suffice to restore wild waterfowl" (page 6 of printed report). We can hardly believe that this paragraph represents the matured opinion of the entire committee, in view of the previously expressed convictions of some of the members.

The new set-up proposed by the committee (pages 21-27 of the printed report) contemplates the appointment of a Restoration Commissioner (to serve under the Secretaries of Interior, Agriculture, and Commerce), who will have under him five directors dealing with Erosion, Fisheries, Wild Life, National Parks, and National Forests. The Director of Wild Life will have charge of all national activities affecting Song, Insectivorous and Ornamental Birds, Migratory Waterfowl, Upland Game Birds, Mammals, Land Acquisition and Development, Wild Life Management, Research, and Education. This new organization is supposed to be financed during the first year by some fifty millions of dollars (or less if only a partial job be desired) to be allotted from emergency money. For maintenance after the first year funds from the duck stamp proceeds, Migratory Bird Conservation Act Appropriations, Tax on Ammunition, and Game and Fur cropping (whatever that may mean) are predicated.

We note that this new and ambitious program has some features in common with H. R. 10604 (also known as the Shell Tax Bill and the McCormack Bill) which was introduced in the House of Representatives in March, 1932. This bill (which failed of enactment) proposed to set up within the Biological Survey an agency of four members to assist and (Continued on Page 194)

"LATE AGAIN!"

Reproduced from an Original Etching

by Diana Thorne

NATURE MAGAZINE

VOLUME 23 APRIL · 1934 NUMBER 4

SPRINGTIME FACTS AND FALLACIES

SOME UNHACKNEYED REMARKS ABOUT A WELL-KNOWN SEASON

BY CHARLES FITZHUGH TALMAN

THE truth about spring, as experienced in eastern middle-latitude North America, lies between two extremes of opinion. One of these extremes is embodied in an assertion made back in the year 1775 by the British colonial governor and antiquary Thomas Pownall. Describing the region along our middle Atlantic coast, he said:

"Its seasons are summer, autumn, or what Americans more expressively call the fall, and winter. The transition from the locking up of all vegetation in winter to the sudden burst of it again into life at the beginning of summer excludes the progressive season which in the more moderate climate of Europe we call spring."

If this statement were literally true, writing about spring in America would be exactly as easy a job as writing about snakes in Iceland.

The other extreme idea about the American spring has never, perhaps, been put so definitely into words, though it is prevalent. It is to the general effect that the season consists of a long and gentle progression from winter's cold to summer's warmth. Arriving somewhere within hailing distance of the first of March, it is supposed to manifest itself unmistakably to our senses, including the unnamed one that registers temperature sensations, until around the first of June.

During these blissful three months "ethereal mildness" is conceived to be the usual characteristic of the weather. No snowstorms or hot waves are supposed to intrude themselves into the program, except perhaps near the beginning and the end of the season, respectively. Our springs are, in short, assumed to be similar to those of western Europe, where there is, in fact, between the comparatively mild winter and the comparatively cool summer, a long period during which the thermometer usually

DOGWOOD—TRADITIONAL BRINGER OF A SPRING "WINTER"
Weather folklore has it that a cold spell attends its blooming, and that of snowball and redbud

maintains a happy medium and never commits great excesses.

The myth of a European spring in America is part of a large body of misfit weather lore that has flourished in this country ever since it was brought over from the Old World. It is kept alive partly by the force of tradition and partly through the influence of European literature and American literature that draws its inspiration from European sources.

It was probably because March brings much lovely weather in England that the English founders of the American Republic selected the fourth of that month as the day for inaugurating the President with outdoor ceremonies, which are sometimes made a dismal fiasco by slush and snow. There was no Weather Bureau in those days to dispel meteorological fallacies.

Today we have weather records galore, yet how many Americans realize that over more than half the United States snow in May is a *normal* occurrence; the average snowfall of that month ranging from a few flakes along the border of the Sunny South to an inch in the extreme North, not counting the mountains, where, of course, it is much heavier? Scorching heat is not unknown in the northern states in April, but in the year 1917 ice hindered navigation on the upper Great Lakes until the end of May, and even as late as June 6 the harbor of Duluth was tightly icebound.

Of course we do have in America a transition season between winter and summer, and it includes every year some spells of weather that we recognize as typically "springy." We welcome the arrival of this season, partly because of its intrinsic charms, mingled, though they are, with much that is not charming; partly because we like variety, and spring gives us a change from winter experiences; but partly, also, for another reason not so generally recognized.

Down to comparatively recent times winter was a season of intense discomfort, or worse, for everybody living north of the tropics. Its cold breath pervaded houses heated only by open fires; the gloom of its long nights was unrelieved by the modern miracle of electric light; the blight it laid on vegetation made food tragically scarce. It was chiefly because spring brought release from the bitter bondage of winter, with its cold, hunger and darkness, that the vernal season became a favorite theme for poets and painters, and that its advent became the occasion of joyous festivals and celebrations, many of which are still observed as the years roll around.

ONE MARCH DAY IN WASHINGTON
The unspringlike setting of President Taft's induction into office on the Fourth of March, 1909

A FAMOUS SCENE RECORDING EARLY SPRING AT THE NATION'S CAPITAL
Washington's cherry blossoms usually open for the delectation of thousands of visitors in the fore part of April but they sometimes bloom at the end of March

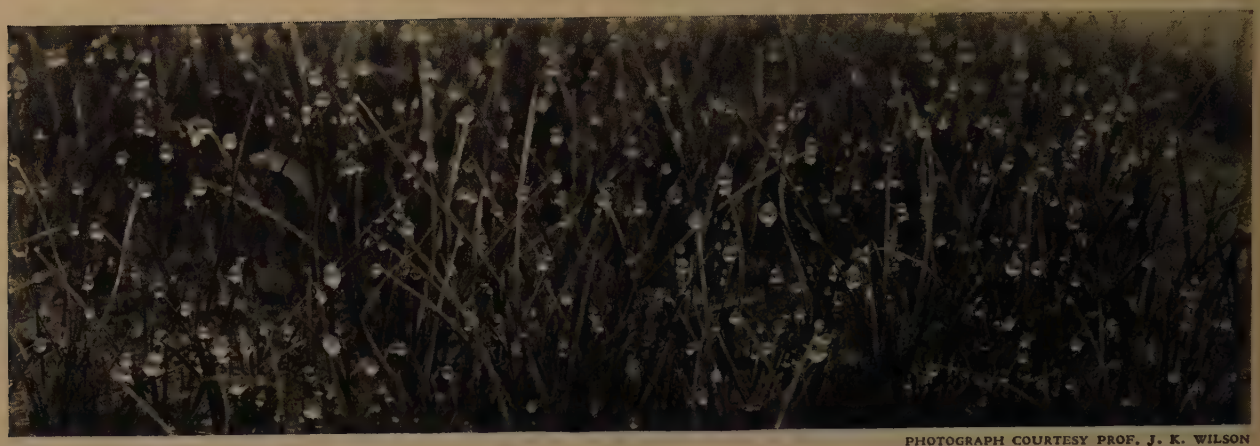
Nowadays civilization has robbed winter of its terrors. For a majority of us—especially those who dwell in towns—it has become the gayest and most enjoyable season of the four; but we are still influenced by the bad reputation it acquired through long ages gone. Thus we welcome the return of spring partly through force of deep-rooted custom—which is our reason for doing a host of other things.

There has always been much confusion of ideas as to when spring begins and how long it lasts. According to the Oxford Dictionary, spring is "the first season of the year, or that between winter and summer, reckoned astronomically from the vernal equinox to the summer solstice; in popular use in Great Britain comprising the months of February, March and April; in the United States, March, April and May." Here we have three distinct and mutually overlapping springs recognized by the leading lexicon of the English-speaking world. One begins February 1, one March 1 and one March 21 (the usual date of the vernal equinox)—a total range of seven weeks!

In the United States and Canada, though the almanacs are unanimous in asserting that spring begins when "the sun enters Aries," the public at large regards the whole month of March as belonging to this season, while even in England, where February is often rated as a spring month, the spring of the so-called "farmer's year" begins March 1, and this division of the seasons is also employed in meteorological records throughout the northern hemisphere.

The convention of assigning fixed dates to the beginning and ending of spring is convenient for a number of practical purposes, but the natural and non-astronomical manifestations of the season do not, of course, observe these dates, but vary in the time they choose for occur-

BOTTICELLI'S ALLEGORY OF SPRING
A graceful and joyous conception of the vernal season. The painting hangs in the Accademia di Belle Arti in Florence, Italy



PHOTOGRAPH COURTESY PROF. J. K. WILSON

MAY BRINGS MAGIC DEW—OR SO FOLKLORE WOULD HAVE IT

The maiden who washes her face in the dew of May Day morning will ever after be beautiful, according to the old saying. This is a blow to the cosmetic manufacturers

rence both from place to place and from year to year.

Many annually recurrent events of the plant and animal worlds have been widely recognized as milestones marking the advent and progress of this season. We feel that spring is here "when the robins nest again and the swallows homeward fly," or when crocuses peep above the ground. In Germany it is an old idea that the arrival of the first stork from the south marks the beginning of spring. Once it was the custom in some German communities to post a man on a tower to keep watch for their feathered harbinger of the season and announce its appearance by blowing a trumpet.

Phenological records, such as Gilbert White once kept at Selborne and as are now kept by a good-sized army of observers in various parts of the world, include the dates of bird migrations, the leafing and blossoming of familiar plants, and the like, and one of their uses is to show the progress of spring's beginning over a country in any particular year, or in the average year. The date generally adopted in Europe for the beginning of the "phenological spring" is the average of the blossoming dates of thirteen common trees and shrubs, selected many years ago by Dr. Egon Ihne, of Darmstadt.

As averaged for a long period of years, the progress of springtime warmth over any region in the temperate zone is a fairly steady movement; but if we study the temperature records for any individual year we shall observe many oscillations to and fro, which may be compared to the advancing and retreating waves on a beach accompanying a general rise of the tide. These oscillations are sometimes extensive, causing spells of unseasonably warm or cold weather over large areas. The cold spells bring night frosts, which may damage fields and orchards and thus attract general attention.

In the Old World frosty spells in spring have long been popularly supposed to recur on about the same dates from year to year. In England a chilly period is expected early in April and it is known as "blackthorn winter," because it is supposed to come when the blackthorn is in blossom. This notion is reflected in our American weather lore in the belief, current in various localities, that a touch of winter accompanies the blossoming of the snowball, the dogwood or the redbud in native localities.

The most famous, however, of the traditional cold spells in spring is that of the "ice saints," said in Europe to occur on the days of Sts. Mamertus, Pancras and Servatius (May 11, 12 and 13), or, in south-central Europe, Sts. Pancras, Servatius and Boniface (May 12, 13 and 14). There has been a great deal of discussion among meteorologists over the question, still unsettled, of whether the annual "march" of temperature really does show some tendency to depart from a smooth curve at particular times each year, as implied in many traditions of the sort just mentioned.

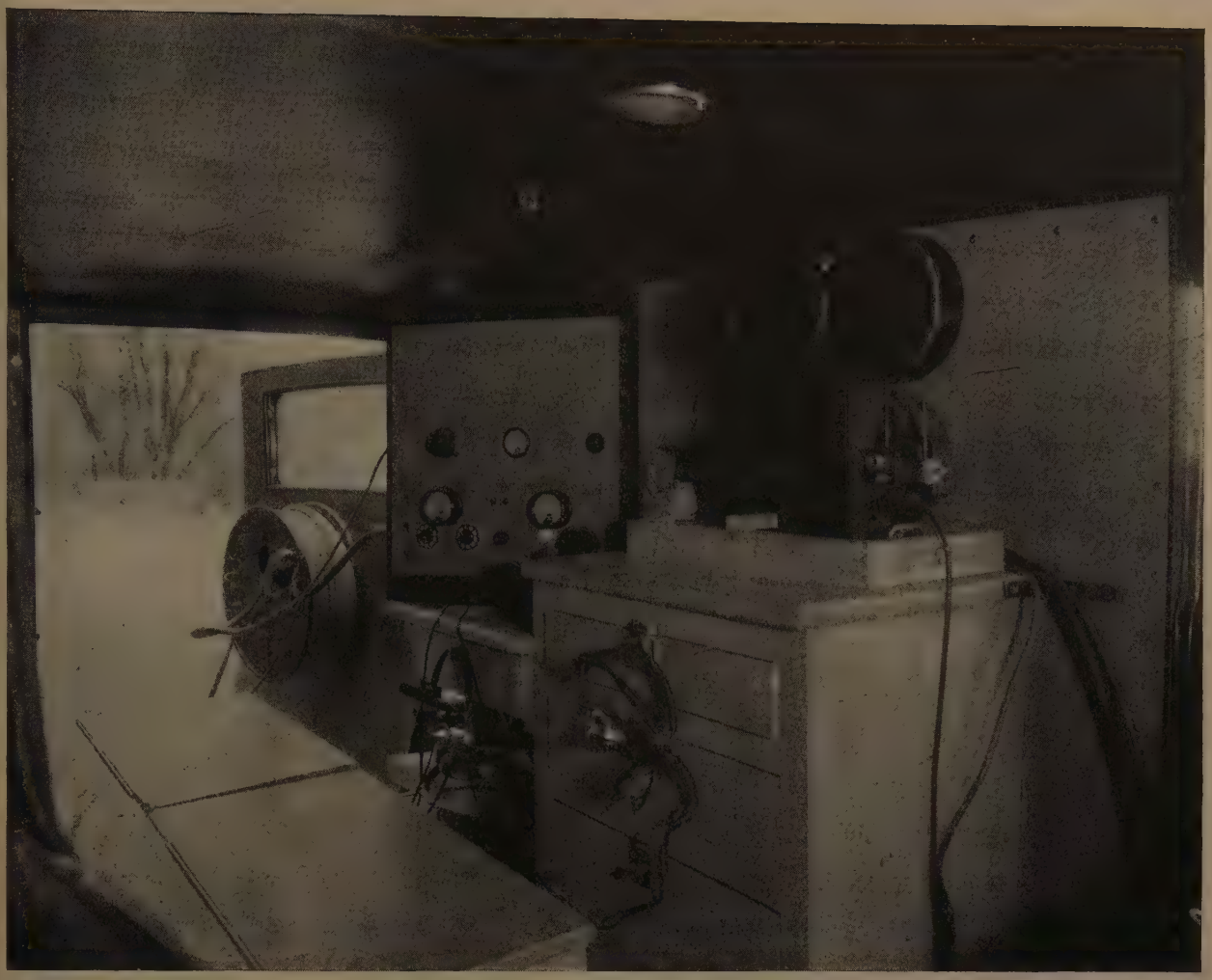
Over the greater part of the United States east of the Mississippi River, March measures up to its proverbial reputation of being the windiest month of the year. April is renowned for showers, but there are few places on either side of the Atlantic where the total rainfall of that month is not exceeded by that of some other month of the year.

The "merry month of May" is responsible for a host of proverbs and quaint notions, and none is more cherishable than the old belief that the dew of this month has special virtue as a beautifier. The dew of May Day morning was most often sought in this connection, but not exclusively, for in Pepys' Diary we read under date of May 28, 1667:

"My wife away down with Jane and W. Hewer to Woolwich, in order to a little ayre and to lie there tomorrow, and so to gather May-dew tomorrow morning, which Mrs. Turner hath taught her is the only thing in the world to wash her face with."

Austin Dobson has poetized this pretty belief:

"The ladies of St. James
  Wear satin on their backs,
They sit all night at ombre,
  With candles all of wax;
But Phyllida, my Phyllida!
  She dons her russet gown
And runs to gather May-dew
  Before the world is down."



INSIDE OF THE SOUND TRUCK WHERE THE SONGS ARE FINALLY RECORDED

The cable on the door extends to the microphone and "sound-straining" device and the other gadgets amplify and record the songs brought from the tree tops

THE SONG HUNTERS

HOW THE SONGS OF BIRDS ARE RECORDED ON FILMS

BY SOPHIE WILDS

A SMALL Ford truck trundles along the deserted road in the early morning hours just before the break of day. Heavy dew is still on the grass, the wind has not yet stirred. It is the hour when birds awake and, beginning softly one by one, gradually increase in numbers and volume until in a rapturous burst of praise they seem to announce the rising of the sun. The chorus sinks again until only a few scattered voices remain to greet man upon his lazy resumption of life several hours later. The truck noses its way through country lanes, over rutty, wood roads. The tires settle into mud and have to be shoveled out. Clearly this overgrown lane with its well-nigh obliterated wheel tracks was never meant for an automobile, even if it is a Ford truck. The occupant of the car, however, seems well pleased with his surroundings and with the absence of all civilization, including inviting macadam roads. All bird lovers know that it is the early bird that catches the worm and likewise the early riser that catches the bird. But the man in the truck, who is Mr. Albert R. Brand, a member of the staff of the American Museum of Natural History, is catching not the bird but the bird's song. He does it with all the resources of radio, engineering and acoustics.

It has long been a dream of bird lovers and scientists to catch the warblings and twitterings of the woods, transfix them on the disks of phonographs and thus listen to them leisurely at home or study them in the laboratory. Simple as it seems, the feat has baffled the song hunters for at least fifty years—in other words ever since the phonograph was invented. As late as 1929, Mr. Aretas A. Saunders published in his comprehensive study of bird songs the following hope: "Perhaps some day we can devise a phonograph that can amplify bird song sufficiently to record those of wild birds. Then we shall be able

to play the record over as much as we like and analyze the song in detail."

So the best that could be done was either to describe the bird song in words, which was just as satisfactory as describing what a Beethoven Sonata sounds like, or to set down what was heard on paper with the usual symbolic musical quotations. But even musicians found it impossible to catch both the spirit and the music of the meadow lark and the thrush. Our musical scale is an artificial thing which has been developed to meet the needs of the composer, whereas a bird chirps and peeps without any scale in mind at all and with a utilization of quarter notes and even smaller fractional tones that can not be set down with the aid of the accepted notation. Some birds like the flicker and bluejay make sounds that can not be represented at all.

It was the motion picture studios that gave Mr. Brand his inspiration. There seemed to be no sound problem that they could not solve. When he studied their ways he found that despite his lack of mechanical training and despite all the sad failures with portable apparatus, he

had to design what he needed himself and to adapt it for transportation in a light motor truck. Even after the apparatus was duly manufactured it was by no means certain that it could be applied to the problem at hand. Mr. Brand had argued to himself that taking sound pictures of diving and swimming contests or automobile races or prize fights with audible splashing of water and yelling of crowds was not essentially different from taking a motion picture of a bird and recording its song. But when he made a test of the apparatus which the builder had assured him would meet every requirement he learned to his cost how exquisitely elusive is the song of the bird. The men ran their truck to an auspicious patch of woods. No wind. Song sparrows were in full and excellent voice. Conditions seemed ideal. Several hundred feet of film were exposed and impatiently developed. The result was disheartening. When the eyes and ears were attuned for bird and song what greeted the ex-

MR. BRAND SIGHTS HIS PREY

The parabolic mirror with the microphone facing its center can be placed as much as three hundred feet from the singing bird. The sighting device makes it possible to train it on the bird and get the subject in the proper place for recording its song without extraneous noises

perimenters was a bull-frog chorus, a dog's bark, the whistle of a locomotive. In fact everything was recorded but the song of the particular bird upon which the apparatus had been trained. The problem proved to be one of sound filtration, difficult enough in a sound studio where extraneous noises, all man-made, can be either choked off by an order or excluded by sound proof walls —but in the open, all but insoluble. The farmer's watch-dog vociferously expressing his disapproval is not easily mollified. A bubbling brook can not be hushed. An unforeseen wind, rising as the day advances, is enough to annul the most careful plans and otherwise perfect conditions.

In the end the problem of sound control was solved by means of a large parabolic sound mirror—or collector—a highly polished disk-like object, three feet in diameter, mounted on a tripod. About a foot away from this parabolic sound mirror the microphone is attached to it. As might be supposed, the microphone faces and is focused on the center of the parabola. It is the function of the parabola to collect the sound, amplify it twenty-five times and reflect it to the microphone. There is a sighting device, similar to a gunsight, on the rim of the mirror into which Mr. Brand peers when he can see his bird and thus train the apparatus. But often he can not see the bird which may be hidden in deep foliage so that he must rely on his ears alone. Then he puts on a head-set and with ear-pieces, listening in, as it were, he shifts his parabolic sound mirror to trap his prey. When the song is at its loudest he knows that the microphone is properly

centered. Thanks to this device the song stands out while the wind sighing through the trees and all other noises which are not focused are apparently subdued —or even blotted out altogether. The result is a full-throated solo with a soft musical accompaniment of the forest. Without the reflector, the microphone would have to be about twenty-five feet away from the singing bird, but with the reflector the distance may be increased to three hundred feet. The electrical recording apparatus is mounted in the truck and is connected with the microphone by a cable 250 feet long. We have then a distance from the truck to the singer of more than 500 feet—enough to catch any wild bird song in the eastern United States, and reproduce it in the form of a sound record. This distance from a shy and nervous bird is often highly desirable in order that its fears may not be aroused. Furthermore, Mr. Brand can remain in the offing and adjust his apparatus to the bird as it flits from one location to another.

MICROPHONE WITHOUT REFLECTOR
It must be much closer to the bird. Below, the truck and the reflector which permit a much wider range for the recording

Although the mirror magnifies twenty-five times, that is still not loud enough for recording. Within the truck there is more amplifying apparatus consisting of a set of vacuum tubes which are much like those of a radio set and which can be controlled by Mr. Brand's assistant. This system of radio amplification does its work so well that once when Mr. Brand happened to be in the truck with the door tightly shut he found himself fighting off an imaginary mosquito buzzing at the back of his neck. It took him ten minutes to discover that the mosquito was flying around the microphone some two hundred feet away.

The sound record made in the woods is exactly like that of a talking picture film. In other words the trills and roundelays are converted first into electric pulsations which travel along the cable to the amplifying apparatus in the truck and then, by a glow lamp which they cause to flicker, they are transformed into lines and bands of various degrees of shading on a film. The high notes of the wild birds are thus recorded as lines, sometimes of such hair-like fineness, as in the case of the yellow warbler, that they can be seen only with the aid of the magnifying glass.

Thousands and thousands of feet of film are unwound and developed to obtain only a few available lengths. Not more than one-tenth of what is unreeled can be used in the final process of converting the bands of light and shade into phonograph records. For this unavoidable waste the birds themselves are largely responsible.

It is a labor of love and infinite patience to triumph over the difficulties that the songsters of the woods throw in the way. They sometimes seem deliberately willful and temperamental. A lovely song breaks the morning stillness. The truck is halted. Microphones are unloaded, quickly set up and connecting cables attached. Those "listening in" to the matutinal concert quickly adjust ear-pieces and make ready to release the switch that controls the film. This will be a marvellous record. The song stops. The audience waits. It begins again. The switch is turned; the film races through the camera. The bird halts again. Precious film is wasted. After a little the film is stopped. Immediately the bird sings, but in the moment that the film is fed out the contrary creature stops. After several attempts of this kind the song hunters acknowledge their defeat. In spite of numerous failures, however, records have been made of water thrushes, the orchard oriole, pied-billed grebe, woodpecker, bluejay, warblers, grouse, the great

horned owl—in fact more than ninety in all, about half the wild birds of the eastern United States.

Nor is this the end. Nature is one symphony of sound. Nearly every vertebrate, according to Mr. Brand, has, during some period of its life, a vocal accomplishment. Even some fish utter sounds. Lower in the scale are the insects which may be as musical as the chirping cricket or as unmusical as the buzzing house-fly. One snake sound is included among Mr. Brand's records of the forest's voices. Indeed it seems that, from the frog up, a voice is indispensable. It is a method of communication and not the meaningless utterance which it seems to be to dwellers among brick and stone. Mr. Brand thinks it probable that vocal cords were developed to bring about matings among animals. Love making without vocal expression is almost inconceivable. Not all birds are equally endowed. Some are more gifted, higher up in the scale of development, than others. The more primitive species make only rudimentary noises. There is no doubt in Mr. Brand's mind that despite all his talking, his noisy dispute, his wranglings, his loquacity, his more artistic expressions on the operatic and concert stage, man is distinctly inferior to the bird in his control of his throat and in his sensitivity to the subtler musical vibrations. After all the highest praise that a musical critic can lavish upon a soprano is to say that she sings like a bird.

CHICO, A SIMIAN PET

BY LEWIS T. BOLGER

WHEN an American woman goes to call on a neighbor she is often remarked to have "a bee in her bonnet." But when a woman of the Brazilian interior goes a-calling she is more likely than not to have a monkey in her bonnet. And while the bee in the American woman's bonnet is purely a figure of speech the monkey in the South American woman's bonnet is a literal, and usually, very animated figure of continual song and chatter.

It is not as a bit of millinery adornment that these little Simians perch upon their mistresses' hats, because even the least animated of them would hardly remain inactive long enough to permit achievement of the proper style effect. Rather, it is just as milady of Park Avenue or Main Street takes her pet pekingese, wolfhound or Scottie for a stroll that the señora or señorita of the Amazon regions feels she should be accompanied by her pet marmoset, tamarin or ouistiti. But instead of taking him on a leash she gives him a place of honor atop *el sombrero;* which is undoubtedly a wise move, since a lively little marmoset on a leash would make strolling a hazardous pastime.

Were it not for the fact that the marmoset and other of the smaller breeds of South American monkeys are so hard to keep alive in captivity here their importation would, no doubt, become a thriving business, because they make ideal pets.

A closely related species of the marmosets of Brazil, probably the tiny *Callithrix goeldi* of Bolivia, may possibly become the exception to the rule of a short life though a merry one for the smaller South American monkey who is removed from his native haunts.

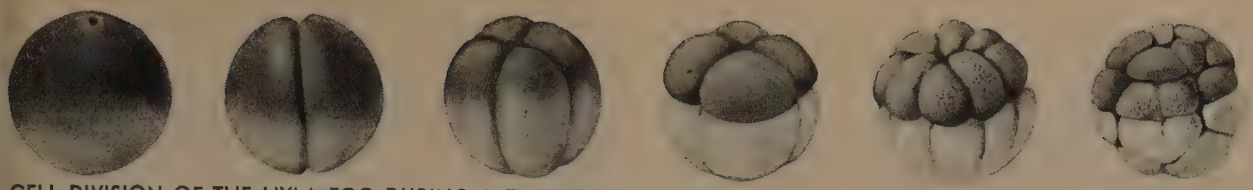
The little fellow shown below with his master, Victor Ruehl of Caldwell, N. J., was brought to this country from the Beni River jungles of Bolivia over a year ago by Mr. Ruehl and his father, Colonel Victor E. Ruehl, international attorney of note. And Chico, as the little visitor has been named, seems to be thriving.

Weighing scarcely seven ounces, though full grown, Chico combines the talents and qualities of watch dog, mouser, companion for his master, playmate for the youngsters, mimic extraordinary and songbird.

One of the principal objections most people have to the larger monkeys is their discordant chatter, but there is nothing harsh about the voice of *Callithrix goeldi.* When all is well in his little world no canary can outdo him. When he is peeved, or alarmed by an unknown visitor or an intruder, his voice takes on a piping quality that serves to make him an excellent watchman.

Except for a somewhat disconcerting way of disappearing behind bookcases or in chandeliers, Chico has no bad habits. He keeps himself as clean as the most particular tabby; confines his occasional fits of sulkiness to brooding silence, and is little trouble to house and feed.

Whether or not his system will become completely acclimated to the changeable New Jersey weather is still problematical, but having survived, without the slightest evidence of physical discomfort, a typical American winter, spring and summer it would seem he is here to stay.



CELL DIVISION OF THE HYLA EGG DURING A TWELVE-HOUR PERIOD

In that time the egg progressed from the fresh egg at the left to the egg divided into thirty-two parts at the right. You, too, may observe such a process

HUNTING WATER SPRITES

BY HELEN DOLMAN

ILLUSTRATED BY R. BRUCE HORSFALL

FORTUNATE indeed is he who lives near a wooded pond for to him is given the privilege of discovering treasures such as many never see. At the expense of a few hours of leisure time he can supply himself with far more interesting pets than the more common ones he could buy.

If you are such a one and are thirsting for adventure some fine spring day, don your oldest clothes and your water-proof boots; pick up a few collecting cans and a dip net, and hie you away to the pond nearest to you.

Should you, being a mere citizen and not a biologist, lack the elaborate equipment and apparatus of a laboratory, do not be discouraged. Just rummage through the trash box and find a few good sized tin cans. Coffee cans are fine. Puncture holes in the lids of a few but leave some intact. These will hold the water necessary for the care of your find.

A dip net may be bought, but a very satisfactory one can be made by bending a stiff piece of wire to form a hoop, which is wired to a handle. I have found a section of a bamboo fishing rod to be a good handle, but it must be strong. To the hoop fasten a shallow bag of muslin. A small trowel tucked in your pocket may prove useful in gathering moss and leaf mold for your terrarium, because that is what you are about to supply.

Thus equipped, make your way to the hunting grounds. You may have to exercise patience as you sit on the edge of the pond waiting for the water sprites to appear. Often, however, it is a matter of accustoming your eyes to seeing the dark shapes against the muddy bottom of the pond. If the edge of the pond is marshy you may have to wade in for a short distance, in which case hip boots are a happy addition to your costume. In some ponds you may reach the shallow water zone on foot, but be careful not to walk out on a quaking bog to the point where the cattails grow or you may step through holes in the spongy surface.

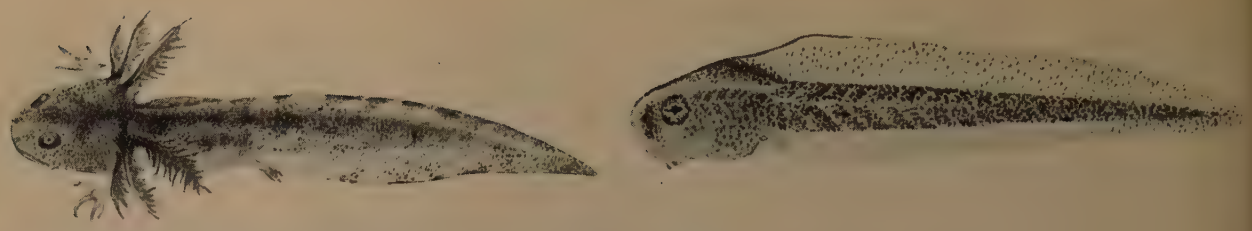
Here, darting about in the shallow water and playing around the submerged stems of water plants, are the sprites which you are hunting. Black, green or brown, depending upon their species, these water babies may be toad, frog or salamander tadpoles, but in this early stage only one versed in amphibian lore can recognize them.

AN EGG MASS OF SALAMANDER EGGS

These may usually be found from four inches to one foot under the surface of the water

Dipping the net in the water a short distance from the tadpoles and pushing it under them, quickly lift it and you will find the net full of dark squirming bodies. Transfer these at once to a can of pond water and add some of the nice green scum which is usually floating on the surface. This scum is a plant belonging to the group of algae and furnishes both food and oxygen for the developing tadpoles.

If, perchance, you arrive too early to find the tiny tadpoles, you may be able to get the eggs from which they will soon emerge. Near the edge of a pond located in a moist woods, you may find salamander eggs, larger than frog eggs and embedded in globular masses of pale green jelly surrounding a twig or old weed stem. These are not as common as frog eggs and are fewer in number. The eggs of the common leopard frog are deposited in loose irregular masses which look much like dirty foam on the top of the water, while those of the spring peeper are often fastened in clusters; the tiny black and cream



A SALAMANDER TADPOLE VIEWED FROM ABOVE AND FROM THE SIDE
Do not mix the sizes or kinds of tadpoles in your terrarium because the salamanders are cannibalistic and will devour each other

spheres held by their jelly to the submerged stems of marsh grass or sedge. In most woodland ponds and even in running brooks, especially near cultivated land, you may find strings of toad eggs on the muddy bottom.

Whichever kind you find, lift them carefully in the net and dump them into a can of pond water. Try to keep the jelly as intact as possible because the eggs have no shells, only their layers of jelly, which help to equalize the temperature and hold water.

Before leaving the pond, take an extra supply of water and any plants that seem to be growing where the eggs or tadpoles are found. If snails are caught in the plants, all the better. They will help to keep your terraria clean.

On your way back through the woods, if you are still ambitious, you may be interested in turning over decayed logs, or in digging down into old stumps in search of adult salamanders. If you do take any be sure to gather moss and leaf mold for their new home and to replace any logs you have disturbed.

When you arrive home with your new pets, the next consideration is their care. I count it a great wrong to collect any live material and to allow it to die for lack of care. Enough will die in spite of all that you can do.

Eggs should be placed in flat dishes with three or four inches of pond water and some of the algae in them. I have seen frogs' eggs successfully hatched in all sorts of containers from a fruit jar to a wash basin, so do not hesitate to try your hand because of lack of proper equipment. However, I have found flat glass dishes with straight sides to be the best. Rounded bowls make poor terraria, for several reasons. They present a minimum of surface to the air and are more easily broken than terraria with straight sides.

The dishes should be set on a table or window-sill where they receive sunshine a part of each day, but away from artificial heat. Remember that these eggs were laid in cold water, under an open sky, where the most valuable ray of the sun was not lost because of a pane of glass. I believe that more water animals die because of over-heating and over-crowding than from any other cause.

A large reading-glass will enable you to see the first divisions of the eggs, if they have just been fertilized when you get them, and makes much more apparent the subsequent stages of development. The absence of shell and the transparency of the jelly make these eggs especially interesting for observation.

EGG MASSES OF THE SPRING PEEPER
They are often found fastened to the submerged stems of marsh grasses or sedges

Watch the eggs carefully and remove at once any which turn white because they are dead and will pollute the water. Healthy eggs soon turn dark all over as the pigmented cells develop and cover the light ones.

When the tadpoles begin to wiggle through the jelly, there will be too many for the dish and it is better to return most of them to the pond and keep only as many as you can care for. A twelve-inch dish will accommodate about a dozen medium-sized tadpoles but will be too small for them later. At first the frogs have no mouths, only sucking disks by which they cling to the algae or the sides of the dish, moving only when disturbed. In a few days their mouths develop and they cluster on the algae or other water plants in the dish. As they grow they may be removed to

deeper containers, which will hold more water. They may be placed in an ordinary aquarium with sand in the bottom and water plants growing in it. It is better not to mix sizes or kinds of tadpoles as the salamanders are cannibalistic and devour each other.

The rate of development depends upon the species, the temperature and the food. I have had leopard frogs remain in the tadpole stage for two years although normally they reach adult stage in half this time. Frogs are vegetarian in the tadpole stage, but your salamander sprites will welcome a bit of meat from the end of a broom straw as they grow older, and especially the larvae of such water insects as mosquito "wrigglers." I sometimes raise mosquitoes under glass just to feed my fish and tadpoles. Lacking the natural food, bits of earthworms, fish or beef may be given. Care should be taken to remove any uneaten pieces, to prevent their decay fouling the water. I find a fifteen-inch length of glass tubing with a rubber bulb on one end, very useful for this purpose, or a rubber tube, using the thumb for a stopper.

When the tadpoles begin to come to the top for air and you can see the front legs under the skin, put a piece of bark or other support in the water for them to crawl up on. At this time it is especially wise to have a glass cover over the container or you may find your pets gone.

In the adult stage, toads may be kept in a glass jar or cage, with garden soil in the bottom in which they may bury themselves. Frogs prefer a semi-wet environment. This may be made by building up the sand and stones on one side of the terrarium so that there is some land above the water. Two or three inches of water is enough for the frog to hide in and to keep his skin wet, which is all that he wants. The little spotted salamander does well in a glass box, or terrarium, containing leaf mold, decaying wood and moss. A glass cover will keep the contents moist and prevent the escape of the salamanders.

All of these moisture-loving creatures prefer insect food and fish worms. The easiest method that I have found for obtaining insects is to sweep the grass and bushes with an insect net, emptying the contents into the cages. Your pets will become very tame, often coming out of hiding to snap up the live insects as soon as they are released in the cage.

Though amphibians can not be credited with any measure of intelligence, their comical appearance, their interesting habits and harmlessness make them most engaging pets. Through the summer they amuse us as they deftly capture their prey with sticky pink tongues or bob under the water, one gold glinted eye alert for danger. When winter approaches they bury themselves in mud, earth or decayed wood and ask no more than a cool undisturbed spot in which to sleep. Best of all, they are the kind of pets that may be had for the "asking" and returned to their native haunts when one is tired of their care or wishes to go on a vacation. No one is ever sorry who goes ahunting water sprites. Just try it and see.

LAST OF SWEDEN'S WILD HORSES

BY HOLGER LUNDBERGH

SMALL and shaggy, with bushy tails, well-shaped legs and large heads are the Gothland ponies, last of Sweden's wild horses. Known since time immemorial as "russar," these diminutive but sturdy animals are still found on the Swedish island of Gothland, in the Baltic Sea, although the herd today numbers only a few hundred. Their principal grazing plot is the so-called Lojstahed, a vast stretch of forest and moor in the center of the island. Here the only remnants of the primitive Scandinavian horse live and increase under protection.

Now and then, when the herd increases in size, Gothland farmers stage a Swedish equivalent of an American rodeo, roping in half a hundred horses at the time. Recently a party corralled not less than sixty, of which, however, thirty broke away and returned to their freedom. In their quite untamed state the small animals were kicking fearfully and the veterinary surgeons who branded them had a busy time. Only the young foals refused to act.

THE APPALACHIAN TRAIL

BY JEANNETTE SPEIDEN

MAP BY GARNET JEX

ARE you tired of brick walls, pavements, radio programs and bridge? Why not spend a day climbing a mountain? To those who live in an Eastern city this may sound rhetorical. It is an invitation.

Hundreds of hikers from Hartford, New York, Washington and other cities are rediscovering the mountains. To them the "Long, Long Trail" is not a song; it is a real trail extending 2100 miles along the crest of the Appalachians from Mt. Katahdin in Maine to Mt. Oglethorpe in Georgia. Begun in 1923, the Appalachian Trail is now complete except for seventy-five miles from Mt. Bigelow in Maine to Grafton Notch in New Hampshire and forty miles in the Great Smokies where the National Park Service is building a new trail.

Although it traverses two National Parks, several National Forests, State forests and parks, the Trail as a whole is not a government project. Benton MacKaye of Shirley Center, Massachusetts, was responsible for its inception. He conceived the idea of a continuous wilderness trail as a retreat from the mechanized life of cities. His article, "The Appalachian Trail, an Experiment in Regional Planning," appeared in October, 1921, and aroused the interest of leaders of outdoor clubs. In 1923 the first section of the Trail, in the Palisades Interstate Park, was marked under the leadership of Raymond H. Torrey. Major William A. Welch designed the Trail marker.

At that time the outdoor organizations of the East were confined to New England and New York where four systems of trails already existed. The Appalachian Mountain Club maintained a fine system of trails through the White Mountains and was constructing a chain of huts. The Dartmouth College Outing Club had developed trails between the White and Green Mountains. In Vermont the lower 100 miles of the 260-mile Long Trail had been constructed. The Bear Mountain and Harriman sections were available in the Palisades Interstate Park.

The proposal to link these existing trails and to continue the Trail northward to Katahdin and southward to Oglethorpe met with approval among the clubs of the North, but there were no organizations southwest of the Hudson. Enthusiasm waned! Arthur Perkins of Hartford revived the project in 1926, and aroused the interest which has carried it on to practical completion. The Trail advanced southward; clubs formed to use and maintain it. The first was the Smoky Mountains Hiking Club of Knoxville. In 1927 the Potomac-Appalachian Trail Club was formed in Washington, D. C., under the energetic leadership of Myron H. Avery. Organizations have sprung up in other cities to carry on. Foresters in National and State forests are cooperating. The Trail

Conference, meeting annually, coordinates the work.

The Trail is marked in three ways. There are blazes on conspicuous trees at frequent intervals. The main Trail blazes are white, except in New York and New Jersey where yellow paint is used, and in Connecticut and a section of Vermont where the color is blue. A double blaze is used to call attention to obscure turns. Metal markers bearing the "A T" monogram are used in addition to the blazes, especially at intersections. At important highway intersections wooden signs give the direction and distance of the next point of interest. Side trails, marked with blue blazes, lead to viewpoints, waterfalls, springs, shelters or historic points in the vicinity.

Guidebooks have been prepared by the clubs responsible for various sections. Four of these guidebooks, giving measured distances, exact descriptions of the route, maps, and notes on the history of each region have been published. The fifth, covering the section from the Virginia-Tennessee line to the southern terminus, will be issued upon the completion of the Great Smokies trail.

The problem of shelter for the hiker who desires to make a trip of several days has been solved in the White and Green Mountains and in parts of Pennsylvania and Virginia by the erection of shelters. Other shelters, open and closed, are being planned with the idea of providing a continuous chain at intervals of about ten miles. The guidebooks give information as to available public accommodations. For example, in the Maine woods it is possible to tramp for seventeen days, covering a distance of 173 miles, spending each night at a sporting camp. A similar eleven-day trip is possible in Virginia.

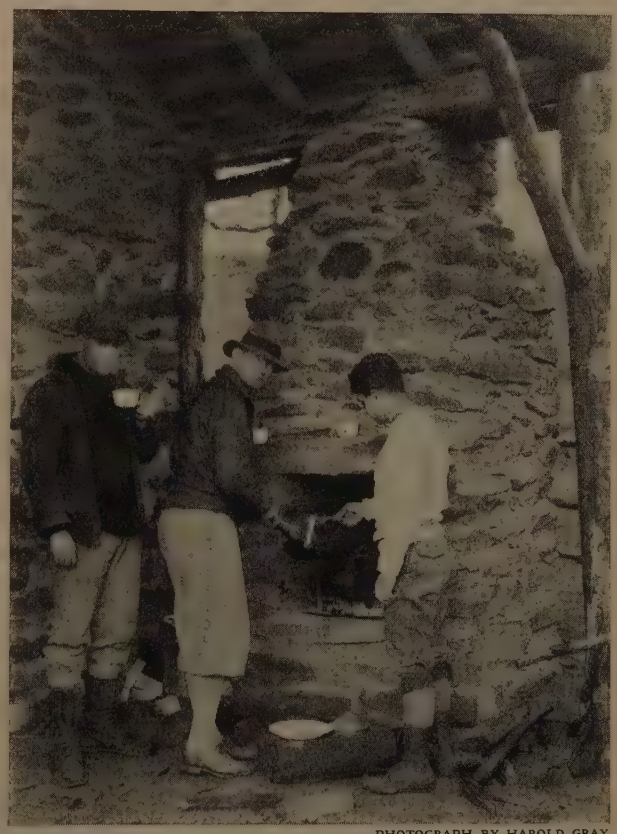
The map indicates the route of the Appalachian Trail but can give no conception of the beauty and variety of the country it traverses. Mt. Katahdin is famous for its sheer-walled glacial cirques, its Arctic flora and its view of lakes and forests. The peaks of the White Mountains also rise above timberline and look down on wooded notches where surprisingly beautiful ravines and waterfalls are hidden. Ponds and vistas through white birches add to the charm of the Green Mountain section. Crossing the Hudson at the Bear Mountain Bridge, the Trail descends almost to sea-level but climbs along the Palisades and over a series of ridges to High Point Park. Through Pennsylvania it follows the narrow ridge of the front range of the Alleghenies. In the Shenandoah National Park in Virginia the Trail climbs a series of peaks which offer incomparable views of that region. The highest point is reached in the Great Smokies where an elevation of 6641 feet is attained at the summit of Clingman's Dome.

The enthusiastic volunteers who have built the Trail and who are maintaining it feel wholly in sympathy with the purpose expressed by Benton MacKaye, "The old pioneer opened through the forest a path for the spread of civilization. Now comes the great task of holding this life in check—for it is just as bad to have too much urbanization as too little. It is just as vital today to open up our overcrowded areas as it was a century ago to open up the overwooded areas. Hence the Appalachian Trail."

PHOTOGRAPH BY GARNET JEX

IN THE WHITE MOUNTAINS

In New Hampshire there are such views from the Trail as this of Mt. Pemigewasset



PHOTOGRAPH BY HAROLD GRAY

BREAKFAST ON THE TRAIL

Sexton Shelter on the Trail in the Shenandoah National Park region in Virginia

PHOTOGRAPH BY GARNET JEX

A VIEW AT HARPERS FERRY

The Potomac Gap is seen from the Trail as one hikes along in this mountain region

NEW PLANTS FROM OLD

REPRODUCTION FROM DIVISIONS, BULBS AND LAYERS

BY F. F. ROCKWELL

PHOTOGRAPHS BY THE AUTHOR

OF THE three general methods of increasing plants—by seeds, by cuttings and by divisions—the last is often the simplest and most certain. Nevertheless there are many gardeners who almost never take advantage of this means of keeping themselves abundantly supplied with plants. Few employ it anywhere near to the extent it may well be used in ordinary garden routine.

Growing new plants by means of divisions, as compared to propagation through seeds or cuttings, offers several advantages. It guarantees an exact reproduction of the parent plant. This is an important factor in the case of the many things which cannot be depended upon to "come true" from seed. Division is often quicker, and almost invariably easier than obtaining new plants from cuttings, except in the case of non-hardy soft-wooded plants (such as geraniums and begonias), and certain hardy plants and shrubs which are not readily divided.

Cuttings, with few exceptions, require considerably more time and attention than do most types of propagation by division. They also require more equipment to make control of conditions possible. Where, therefore, new plants of a certain species or variety are to be had either by cuttings or by division, the latter method is usually the easier to employ.

This brief explanation of the advantages of division as a means of obtaining new plants is not meant as an argument against the other methods available. The wise gardener, making himself familiar with all, will use whichever best fits the exigencies of the case in hand. Any of them make it possible not only to supply as many plants of the varieties on hand as may possibly be wanted, but also by having extra plants available for "swapping", constantly to extend one's assortment of perennials, shrubs or bulbs without extra expense.

SOME PLANTS FORM SPREADING CLUMPS

Among these are Sweet Williams, the phloxes, hardy pinks and other familiar garden denizens

THE CLUMPS MAY BE DIVIDED

The divisions of each clump may themselves be replanted to produce new plants and more clumps

In passing, it may not be amiss to suggest here that plant "exchanges" have proven a popular feature of many garden clubs. Members with surplus plants of some desirable thing turn them in to the club exchange either to be traded for some other desired variety, or to be sold or auctioned to club members, the proceeds providing a source of revenue for the club. Usually these surpluses are merely hap-hazard or accidental, but there is no reason why they could not be planned for and developed on a scale which would make choice new things available to club members quickly and inexpensively.

To return to the practical side of making new plants by "division", there are—as in the making of new plants by means of cuttings—a number of quite different types of procedure.

First of all, there are Nature's own practices in employing "divisions" as a means of propagation. True bulbs, such as the daffodil, or the humble (but not retiring) onion, split up or divide into new bulbs, which, as they grow to a larger size, in turn again divide. Sometimes, as with certain lilies and occasionally with some tulips, these new bulbs are produced above ground in the axils of the leaves. The "top" onion forms a whole clump of small onions at the end of a strong stalk like that which bears the seed pod of the usual type. Still

other plants have runners and off-sets, like those of the strawberry and the house-leek or "hen-and-chickens", which make roots and eventually become entirely separated from the parent plants. Then there are "tip-rooters" such as many of the brambles; and "leaf-growers", such as those water-lilies which have new plants sprout, without apparent rhyme or reason, from their floating leaves.

So Nature, unassisted, accomplishes propagation by means of various forms of division. But with a little assistance, she will work wonders for the alert gardener. Artificial forms of division include the separation into smaller sections or pieces of close growing "colonies" of plants, such as lily-of-the-valley; the division of "crowns", like those formed by many perennials, including bleeding-heart, Shasta daisies, coral-bells, delphiniums; the partition of tuberous and rhizomatrous roots, like those of dahlias and of bearded irises; the cutting up of bulbs, corms or tubers—as in the case of tuberous-rooted begonias, or the plebeian potato; the "scaling" of lily-bulbs; and "layering", or inducing the formation of roots on parts of plants later removed from the parent plant, as is done with raspberries, some climbing roses and many shrubs.

The simplest and most easily accomplished kind of division is that practiced with plants which spread out into clumps or colonies. Lily-of-the-valley, rudbeckia, golden glow, long-established plantings of hardy chrysanthemums and physostegia are familiar examples of this type.

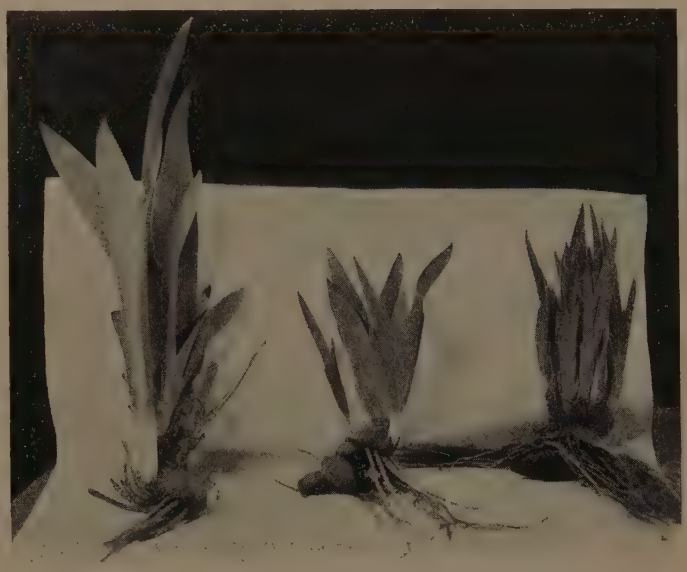
To divide such as these, there is necessary nothing more elaborate than the use of a trowel, or a spade—most trowels are worthless for any work heavier than the digging up of seedlings!—with which to remove "chunks" of the mats of roots and tops. These cut-out sections are replanted in holes sufficiently big and deep to take them, with the tops level with the ground surface, just as they previously grew; and the job is done.

But simple as this operation seems, there is a correct way of doing it—and several which are not and which may wreck the results. To begin with, the section or "sod" removed from the original colony should be cut out clean, with as little disturbance as possible. When replanting cannot be done quickly, keep it moist and well protected from sun and wind. A good and convenient method of handling such divisions is to place them, as they are dug, crowded close together in a flat and cover them with damp burlap or old bags.

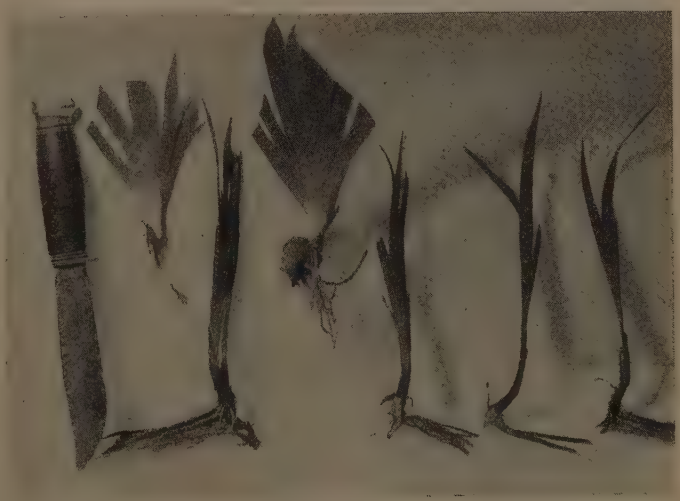
Next—in the order of simplicity of the operation—come those perennials which make low spreading crowns or clumps, but which are not quite so "matty" in habit as the type just discussed. These can be removed bodily from the soil, and separated or cut apart into several smaller "divisions", each of which is then replanted as a new plant. By the use of a sharp spade (or a lawn-edger or a knife) sections may be cut from them where they are growing. The former method is usually the better because old clumps are likely to contain more or less dead material and over-crowded shoots. A comparatively small division, consisting of vigorous new growth, even the first season will often make a finer plant and give better flowers, if not more of them. Most of the pinks, Sweet Williams, the hardy phloxes, both tall-growing and low-growing, and plumbago are examples of this type of plant, which includes a great many of the popular garden perennials.

Plants with roots which are more or less thick and fleshy, extending deep into the soil, offer considerably more of a problem. The peony is a good example of this type. Others somewhat similar but not quite so difficult are hardy delphiniums, foxgloves, anchusas and Oriental poppies.

With such as these the old clump should be carefully dug out with a stout spade or fork, taking care to get well down under the roots so that no yanking and pulling will be needed to get it up. Then wash it clean of soil with the hose, or by sousing it up and down in a



RHIZOMATROUS IRISES ARE EASILY INCREASED
From left to right are replanting size divisions of tall bearded, dwarf bearded and Japanese irises



THE RESULTS OF FURTHER DIVISION
For propagation only the divisions may be made much smaller and handled much like rooted cuttings

STEPS IN DIVIDING AN OLD PEONY ROOT

The clump of roots trimmed back with soil washed out; separating into smaller sections and cutting up into planting size divisions with three to five eyes each

tub of water. This is particularly important with old clumps which are likely to contain dead or diseased portions that should be discarded. If the roots are very brittle it is well to let them remain long enough to wilt slightly before "operating" on them.

A careful examination of the clump to be divided usually reveals where it can be separated easily into several pieces. For this purpose use a sharp and trusty blade, such as the regulation hunting knife. Even if you can find the opportunity to purloin surreptitiously the cook's pet slicer, the chances are you will break it, or you may give yourself a serious cut!

A brief study of the several steps in dividing a peony root, as shown in the accompanying photographs, will show more clearly than several paragraphs of text how roots of this character are handled. Where there are distinct "buds" or "eyes"—as in the peony—from which new growth will be made, several of these should remain with each "division". Select only new vigorous growth; and as each piece is selected, trim it up in workmanlike fashion, cutting off broken or bruised roots and those which are too long for convenient handling.

Still another class of plants are those with rhizomatous roots. The most familiar representative of this group is the popular garden or tall bearded iris. These are among the easiest of all to propagate by means of division because the thick fleshy root-core, from which active feeding roots are put out, will withstand a great deal of neglect and abuse. (Not infrequently discarded sections of iris roots, thrown on the refuse pile, will take root and grow vigorously.) All that is necessary is to cut the old spreading colony-like clusters up into pieces of the desired size, and replant, covering no deeper than they formerly grew. The Japanese and Siberian irises, with roots more fibrous in character, should be treated more like the clump-forming perennials.

The time for making the divisions is in many cases important. With few exceptions, it is best done while the plant is dormant, or resting. As a general rule, the sooner accomplished after the plant goes into this state the better. The exceptions are those plants which are more successful with spring than with fall transplanting; or that may be divided more readily when some top growth is present.

A few plants may be mentioned as examples. The best time for making divisions of the garden or tall bearded irises is after they have finished blooming and the new foliage has matured. With peonies it is as early as possible in the fall, when the foliage has ripened and the crown buds are readily discernible but have not made sufficient growth—as they will have done by spring—to be easily broken or injured. The bleeding-heart is one of the many which is easily divided and transplanted in spring when growth has started, but when it has not matured sufficiently to wilt badly as a result of the disturbance—an important point in all spring dividing. Delphiniums if cut back after flowering start vigorous new shoots from the crown and may then be divided, thus becoming well established before fall; otherwise it

is best to leave them until early spring before dividing.

The *size* of the division to be made depends both upon the character of the plant and the purpose in mind. For maintaining the hardy border in first-class condition, old clumps should be divided every two to four years—depending on the kind of flower and the growth made—into several good sized pieces, each of which will make a strong flowering clump the first season. For purposes of propagation, where the object is to get as many new plants as possible, the divisions may be very much smaller—a single stem or bud with its quota of roots will answer.

These small divisions are practically just ready-rooted cuttings, and should be treated as such. A good method of handling them is to set them out in prepared soil of half peatmoss and half light rich loam, either in a frame or in small pots, and giving them little special attention in the way of watering and shading until growth starts. Such plants, grown in pots, will be much easier to establish quickly in their permanent positions in the border of the rock garden. Even with the larger size divisions, which are to be replanted directly in the border, it is well to place a shovelful of prepared soil under each division to induce the quick formation of new feeding roots.

The method of handling bulbs and tubers is known to most gardeners. Such clump-formers as dahlias and cannas are kept over winter and divided before planting in the spring. With dahlias a piece of the "neck", with one or more eyes, must be left with each tuber. Some corms, such as those of the gladiolus and the tuberous-rooted begonia, may be cut into two pieces—seldom more—with an eye to each. Lilies, daffodils and a number of others separate readily without cutting when they have developed sufficiently.

All vines, most trailing plants, and a number of semi-trailing, semi-climbing, or drooping plants and shrubs may readily be increased by "layering". Examples of these several types are grapes and honeysuckles; hardy vincas; dewberries and black raspberries; bush-honeysuckles and forsythias; jasmine and euonymus, and trailing, pillar and climbing roses.

The method is simple. It consists merely of securing the shoot firmly in position by means of a stone or a notched peg, and covering the tip, or an eye half-way along the branch, with prepared soil such as that described above. Plants with fairly hard wood will root more readily if the shoot—

DIVIDING UP THE MOUNTAIN PHLOX

Such small divisions of the original plant as this may readily be secured from many of the commonly used spreading perennial plants

which should be young but "firm"—is cut or notched where it is to be covered with earth.

After roots form the "new" plant is severed from its parent and transferred to the desired location. If the roots are induced to form in a four- or five-inch pot, the subsequent transplanting may be done with greater assurance of success.

Many clump-forming shrubs, such as privet, barberry, dwarf box, and Japanese quince, and some clump-forming vines, such as honeysuckles and clematis, may be quite literally "divided" by cutting through the clump with an old axe or a sharp spade, and replanting the resulting sections of roots and tops. Both roots and tops should be pruned back somewhat, but large sized divisions such as these will give immediate results and are often desirable where a background, hedge, or screen is wanted the first season.

PROPAGATING SMALL DIVISIONS

Using a frame and planting either in soil or pots is the best way to form strong individual plants under good controlled conditions

THE BLACK-NECKED STILT KEEPS A WARY EYE ON THE CAMERA LENS

After the blind had been left long enough for the birds to become accustomed to it, this parent came boldly to the nest, turned the eggs and went steadfastly about sitting on them

A CALIFORNIA MARSH IN SPRING

BY RAYMOND B. COWLES

PHOTOGRAPHS BY THE AUTHOR

A THIN veil of fine light mist hung over the salt marshes of Rancho la Ballona, drifting in gently from the open sea. An early morning breeze eddied, and thinned or thickened the gauzy drizzle. Gulls leaving for their fishing grounds squalled musically overhead and floated past, now plunged in half obscurity, now emerging into open spaces between the denser patches of the mist.

Off toward the nearby hills a flock of long-legged birds screamed shrilly as they followed something moving in the *Salicornia* bushes which grew near the edge of an open pool. As they moved they sometimes paused to hover, dropping low over the weeds. As they did so, they trailed long slender legs of a bright red hue. They were black-necked stilts, and it was clear that only the presence of nests in danger from some enemy could have disturbed them so. We walked over the fields, stumbling knee deep into holes of stagnant water, underlain with black and even more repellent mud, but still we plowed along. When almost halfway to the nervous birds a plume of waving white showed above the weeds and soon a cocky mongrel dog emerged. Once white all over, he was now mud-black except for the waving plume of tail which first showed where the trouble lay.

Our presence scared him from the marsh, but when he left the flock of nervous birds came winging over to investigate. They did not realize what we had done for them, and their screeching protests made bedlam in our ears.

The nests were hard to find, and as we walked along the marsh's edge the stilts would rise and settle so far ahead of us that they were little help in guiding us to their treasure. In fact, they had no wish to guide us.

THE KILLDEER STROLLED ABOUT

These picturesque birds were found in numbers on every open flat, their coloration blending effectively with their native surroundings

We found a nest at last and it was clear why we had wasted so much time in hunting them. The pickle-weed, sometimes known as salt-bush, and, better still, as *Salicornia,* grew in clumps along the margins of a temporary pool. It was in these clumps the eggs were laid. The nest was made of pressed-down stems, some alive and green. The eggs so closely matched the color of this type of nest that they blended perfectly with the background. Dull browns and greenish browns, mottled, and with borders of each marking indistinct and out of focus, made the eggs almost invisible. The nest, since it was made of living stems, did not appear to be a nest at all.

We looked our fill, and watched the frantic birds parade around us, chattering their distress and playing injury to delude us. They came so close at times that almost every mark and feather showed distinctly, and when they fluttered feebly past, pretending to be badly hurt, we could watch and see their glistening eyes studying us, and watching our every move in hope that we would respond and try to catch them.

It was not kind nor wise to stay too long. The eggs might grow cold and the spark of life within them die, so we headed back across the marsh, and left the fields behind us to grow quiet with our going.

Not far from where we found this nest, a highway and a street car line run close together past a gun-club, and here a pair of small and graceful birds darted past us, overhead. Another pair then followed, and soon on every side more birds were flying about. These were also black and white, but black was present only on the head. Just like the stilts these birds were anxious, and showed by every common sign that they were nesting quite close by. We walked beyond the buildings of the club, out into open ground where we felt sure the birds would nest. Soon our company of terns grew thinner, so we faced about and strolled back toward the buildings, and the ranks of anxious flyers grew again.

Least terns nest out on open ground, and it seemed as though we ought to see their eggs on every side, but we searched for half an hour before we saw our first one. When accustomed to their appearance it was not

THE LEAST TERN ON ITS NEST

They laid their eggs in little hollows, often in patches of white alkali which made the eggs blend with the ground

hard for us to find more, and soon we located all the nests that we could need. There was no nest unless one could call a little scraped out hollow by that name, and yet the eggs were just as safe on bare and open ground (some of it white with alkali) as were the stilt eggs where they lay not far off, protected by surrounding vegetation.

Next day we hunted for the stilt nest once again, and then prepared to get some pictures. We set the sacking blind on deeply-driven stakes, so close beside the nest that we could plainly see the markings on the eggs; then, to let the birds get used to new surroundings, we left the place for several days.

About the first of June we walked along the marsh again, this time in search of photographs. It was not quite as easy to get pictures as we had thought. The birds were shy and spent an hour squalling up and down the marsh. As soon as one pair calmed a little, another started over again, then for a little time they all joined in the chorus and veered away from their nests.

The blind was steaming hot and not too free from swarms of big mosquitoes, and yet it was not hard to wait. One's feet sank ankle deep in rich malodorous water, but in its very richness it proved all the more attractive. Small white dots kept darting through the brackish fluid, and in one's hand proved only water-fleas, a source of food for many water-loving animals. Mosquito wigglers, in their numbers, gave promise that in time a blind might be much worse, and lots of other insect larvae seemed to thrive in stagnant pools.

CAREFULLY TURNING OVER THE EGGS IN THE NEST

The black-necked stilt performs a preliminary rite before sitting on the nest. Note how the markings on the eggs make them blend with nest and surroundings

In one long spell of silence, between the various clamors of the stilts, a San Diego song-sparrow flew out from a tangle of weeds and perched a foot or so above my head. At first I only heard the faint scratching of its claws as it gripped the sacking roof, but only a moment elapsed before it poured out a full-throated song. Not far away a colony of red-winged blackbirds had their nests, and through all the hours in the blind there was never a single one when at least some bird was not gurgling out his song.

When the stilts at last grew restless from long wait-

ing, the pair we watched commenced a cautious progress toward the nest. Both birds came close, but one, less circumspect or braver, walked right to it, and, bending over, turned the eggs. Then, after one keen glance around, it settled down to keep them warm.

As soon as it had settled comfortably in place, it fixed its gaze upon the lens, protected by a hood, and after that, for steadfastness of scrutiny there was little choice between the lens and eye. Each time the shutter clicked an eye would wink, but after one or two half-hearted threats to leave, the parent stilt remained as calm as though there was no danger near. It seemed wisest to allow the bird to incubate its eggs a while. They must have cooled throughout that long wait while the parents calmed down enough to face the dangers they thought lying in wait beside the nest. So when enough pictures had been made to fill the need for certain poses, it was decided to wait and watch while the eggs were warmed once more.

BABY BLACK-NECKED STILTS

These youngsters are born with the ability to walk soon after they are out of their shells

We left the blind in place and went to watch the terns, and there, from time to time, we worked until about the last of June we returned to watch the stilts once more. The day was warm and humid with just a trace of drizzling mist, and as we neared the nest the parent birds rose up and clamorously invited us to leave. We walked ahead, through tangled clumps of solid pigmy jungle, but underfoot the ground which had been ankle deep in water was dry and firm. Around the nest, where water had stood inches deep, there was no sign of it, except a green and slimy scum. The little pond had dried and left the nest out on a barren flat, not where it should have been, with water all around.

The eggs had hatched, but we were just in time. Close beside the nest, invisible in fluffy down, four little stilts, like tiny, downy chicks, lay huddled in the shelter of some straws or twigs. They could not have been more than one or two hours old, but even so they could toddle and a little later would have gone.

Between these mites of fluffy life and the closest pond, where food and drink could be found, stretched two hundred yards or more of tangled weeds, so thick that from above it seemed impossible that any bird not born to slip between the stems could, even with the best of luck, struggle through more than a few yards. These little birds were hatched to run about along open causeways, between the weeds and grasses that border almost every pond, yet here they were, marooned, no food or water near, and what to them would equal miles of densest jungle lying between.

We did the wisest thing we knew, left them there to fate, and hoped that somehow they would find their way to food and drink. There was no way by which we might have helped, and there was no way by which we could have followed out their destiny, but when we left, their parents hovered overhead and then returned to watch their offspring at the nest. We hope that all went well and that the downy young managed at last to reach the shores of some marsh pool and grow. And if their parents know enough, we can be sure that that is what they did.

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Many of our readers who were enthusiastic about the article by E. Chesley Allen in our January issue will be pleased to know that another of his delightful Nature stories will appear in the May issue. Devotees of the rod and reel will find much to delight them in the story of the trout which Arthur Hawthorne Carhart has written for May. There are many gardeners who do not realize that there are many bulbs that may be planted in the month of May for all-summer enjoyment. F. F. Rockwell will introduce these in the next issue. From England we have a story, with some remarkable pictures, about the bittern, a bird which bears a close resemblance to its American cousin. Carroll Lane Fenton will take us up another western mountain side and introduce us to some more ancient denizens of prehistoric seas. These are a few of the interesting articles in the May issue of Nature Magazine.

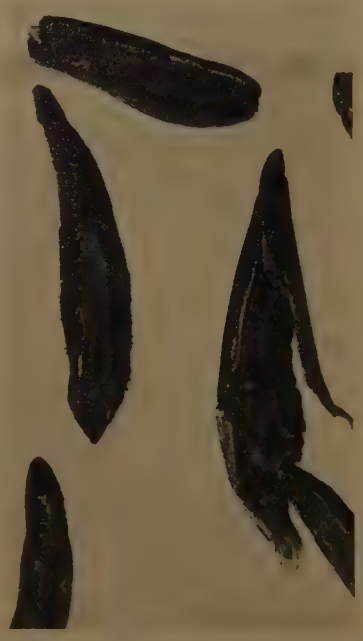
ERGOTIZED BEACH GRASS
The black spots indicate infected parts. Cattle are seriously affected by ergots

ERGOTS AND ERGOTISM

A STRANGE HUMAN DISEASE CAUSED BY A FUNGUS

BY ALBERT A. HANSEN
PHOTOGRAPHS BY THE AUTHOR

A RECENT outbreak of ergotism among the Jewish population of Manchester, England, due to eating rye bread made from ergotized flour, has aroused considerable interest on this side of the water because the fungus responsible for the trouble is common in rye, wheat and a number of wild grasses found in all parts of the United States.



The fungus attacks the ovaries of grass flowers, eventually forming hard, black and purple boomerang-shaped bodies that contain a drug known as ergotine. Ergotine is distinctly poisonous, sometimes causing abortion among farm animals and occasionally a disease characterized by the sloughing off of the hoof, tail-tip and other extremities. The writer once fed ergot to a cock and the bird soon began to lose its comb. Bread made from ergotized flour was responsible for the ancient disease known as St. Anthony's Fire, a malady that has swept in epidemics through France, Germany, Switzerland and other European countries since the days of ancient Rome. Severe outbreaks of animal ergotism have occurred in America during 1820, 1857 and 1892. On account of the peculiar effect on the hoofs, the outbreak of 1892, which swept through the Middle West, was at first confused with the infamous hoof and mouth disease that is so dreaded.

RYE THAT HAS GONE BAD
One of the commoner cultivated plants susceptible to the fungus

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THE SEED IS REPLACED
Grasses found along a fence row that show the infection

That ergots are really tiny fungi can readily be demonstrated by allowing some of the dark ergot bodies to lie on the ground over winter. During the following spring each ergot will sprout, producing a number of fruiting branches that greatly resemble miniature mushrooms. Ergotine, the drug extracted from ergots, finds use in medicine but it is dangerous in the hands of the unskilled.

Ergots are not difficult to find in fields of rye, wheat and barley, and in quack grass, brome grass, red top and other wild grasses in fence rows, when they seem always to be a source of wonder to the uninitiated. Farmers frequently mistake the strange little black bodies for abnormal seeds. This is only to be expected since the fungus structure seems actually to replace the seeds. Due to modern milling methods that remove practically all the ergots before the grain is ground into flour, there is little danger of human ergotism in the United States although authorities interested in American milling are constantly on the alert for any signs of this ancient trouble. Occasionally, however, ergots bring grief to farmers and dairymen by afflicting cows, sows and other domestic animals. The disease is believed, I am happy to say, to be on the decrease.

THE COMPLETE CRICKET HOUSE IN ALL ITS LUXURY

At the left is the conservatory with growing things, then the well-stocked pantry, then the bedroom with sand for burrowing and, finally, the living room

CRICKET—AN INSECT

BY MARCIA M. EAGEN

OF COURSE I have known for a long time that cricket is a game played with bats and wickets, as well as a cheerful, chirping insect. But it was not until recently that I discovered that the insect can be as much fun as a game. It all started when I bought a cricket house, which is not a place where the bats and wickets are kept but a place where crickets live in the lap of luxury. Indeed, they enjoy more than usual comforts.

My cricket house has four rooms. They are not the orthodox rooms of the well-planned apartment because they consist of a conservatory where grass, clover and dandelions flourish; a pantry with well-stocked shelves of food; a bedroom half filled with sand so the householder can burrow when chilly; and a living room. The latter room is equipped with two levels, the main floor and the basement, to which stairs lead. The house has doors from room to room, but they are small holes that may be closed by turning a revolving disk. It is a modern building since the walls are almost wholly of glass.

FATHER CRICKET IN THE LIVING ROOM

Below is the basement and what looks like the furnace, to which Mrs. Cricket clings

Mr. and Mrs. Cricket came with my house. They entertained me from the moment of their arrival. Throughout the summer the male cricket put on his musical repertoire for his better half. Rubbing his wings together, he made merry, chirping and listening to his own music with his ear, which is a tiny white spot on his elbow.

In September Mrs. Cricket began laying eggs. She selected a spot in the garden, loosened the soil with her strong back feet and thrust her long, sword-like ovipositor down into the soil. She may lay as many as three hundred eggs in a season. Before October had passed both Mr. and Mrs. Cricket had died. The eggs began to hatch in November. Tiny little cream-colored bugs were to be seen crawling about the glass sides of the garden unit. These soon turned into small, tan crickets which remained sticking tight to the glass until they had turned dark brown. Then they hopped off and started to explore the garden.

It was not long before I discovered that I needed a more secure place to keep these young crickets, so I got out an old aquarium. Placing the garden unit in this, I covered the top with wax paper fastened all around with adhesive tape. A sheet of glass will serve equally well. Crickets need no water or air except that obtained from their food and the oxygen given off by growing things. A few stones and some sand on the floor of the aquarium, a fresh piece of lettuce, an apple core, a lump of sugar and some cracker crumbs, and the crickets were happy. Now and then I set the aquarium in the sun which seems to delight the inmates, for they enjoy its welcome warmth.

One day I came home to find one of the half-grown crickets changing his suit. That is the way they grow, shedding their skin when it becomes too tight and slipping out of it, head first. If you are fortunate enough to catch one at this you will see that the cricket emerges a golden brown. Later he eats up his suit.

The males and females look alike until they are nearly fully grown. Then the female is the larger and has two fleshy prongs, called cerci, and the long ovipositor at the end of the abdomen. The male has the two cerci and longer wing coverings.

THE GARDEN UNIT IN THE AQUARIUM

In this way a satisfactory home is provided for the young crickets from which they do not escape

Cricket houses may be purchased with grown crickets as tenants or with eggs already in the soil, depending upon the time of year. Whichever way you set up a home for these interesting chirpers, it is a most entertaining experience in being a landlord.

WESTERN SKUNK CABBAGE

BY HAMILTON M. LAING

HARBINGER OF THE SPRING IN THE NORTHWEST WOODS

At the left a single western skunk cabbage and, below, a number of them growing in a favorite location

NO MATTER what the geographical location, the first spring flower is always an event—that is, especially in northern latitudes. Out in the coastal Northwest where Spring comes almost any time after the New Year, it is often difficult to decide what flower should claim early honors, but of two or three that may greet departing February, the homely-beautiful skunk cabbage must often be accorded first place.

The western skunk cabbage, with name, *Lysichiton camtschatcense,* almost as forbidding as its odor, is an arum and so a cousin of the well known Jack-in-the-Pulpit or Indian turnip of the east. It is a product of the black muck soil of the swamp and the warmer the location the earlier it blooms.

At first sight of this plant in February we see a small sharp conical spear thrust up out of the black soil. It gleams bright yellow so we spot it afar, and where a number come in company the sight is striking—as though the earth were summoning her forces to subdue the harshness of Old Winter, and to substitute the gentleness of Spring, and had given forth a company of warriors with golden spears. If we dig into the soil in September or October we will find these little spears, each holding, tightly wrapped in its golden sheath, the whole plan of the bloom of spring.

What haste it makes to reach four- or five-inch stature. Outwardly a simple flower, the large yellow spathe or hood shielding the spadix with its tight-packed flowerets within, the whole creation seems literally to thrust itself into full bloom in a day or two. Then its musky odor loads the spring breeze —doubtless to the joy of the first insects to be abroad. The spadix of course soon outgrows the sheath and leaves it to fall away, the seed spike rising to stand alone over a foot in height.

Like its relatives this plant has a biting acrid juice that will guarantee a sore tongue, yet bear and deer dig it early from the soil—possible as a spring tonic. As medicine for man it is probably too drastic and it can scarcely be recommended as a house bouquet yet if we can but forget its musky breath, and remember that Nature must give thought to others, we must accord its golden loveliness the homage we pay first blooms of Spring.

WHERE THE ANCIENT BRACHIOPOD FOSSILS WERE FOUND

It was a lucky chance that they were discovered on the trail from the lake to the pass above

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EARTH'S OLDEST ANIMALS

BY

CARROLL LANE FENTON

UNDER a bright July sun, we walked up the valley of a creek near the Big Belt Mountains of Montana. A broken corduroy road was our path. It ended in a tangle of cattle trails leading to the foot of a limestone cliff up which we intended to climb. That cliff held fossils of early plants, and we had traveled two thousand miles to see them.

On a ledge where limestone and "slide rock" joined, we paused to eat our lunch. As we took out our sandwiches and fruit, an eagle swooped close to our heads and voiced an angry, squealing cry. Wondering at her obvious rage, we discovered her rambling, coarsely-built nest in a cottonwood not far below. Two ugly eaglets rocked to and fro, now and then hissing requests for food that their parent was much too disturbed to grant.

THE HEAD OF AN ANCIENT SEA SCORPION FOUND IN LIMESTONE IN AUSTRALIA

Below: a drawing of the brachiopods of ages gone whose fossil remains were found in rocks in the Montana mountains. When undisturbed their valves gaped open above the surface of the mud feeding; frightened, they disappeared beneath the surface

Lunch eaten, we began to climb, pausing to search gray ledges of rock for the outlines of simple plants. But what were those queerly wrinkled things on the surface of one block of stone? They suggested rounded off triangles. No plant ever grew like that. Might they be primitive fossil shells, in rocks older than any in which shells were known, at least in North America?

Such problems can't be solved on a cliff where one has other work to do. So we packed the specimens in our bags, and, later, carried them back to our waiting car. There they traveled for more than two months, stowed away among hobnailed boots, squares of bacon and cans of beans.

At last the fossils followed us home, to lie in trays upon a desk. Thick technical books were piled about; books describing early shells whose proper name is brachiopods. Though we tried hard to disbelieve, we simply couldn't deny the fact that these really were fossil shells, unlike any others known. Unless our geology was strangely wrong, they were older by a hundred million years than any others known in America.

What were these shells like in the days when they were alive? Though so very old, they may be

compared with forms that now thrive in Manila Bay. Their thin, wrinkled phosphatic valves probably were banded with green; when undisturbed, they gaped apart to let food and water in. Between their pointed tips extended long, wormlike stalks that burrowed down into the mud. If danger threatened, those stalks jerked down, pulling the entire shells into holes. Left alone, they once more emerged, to resume their endlessly slow task of eating.

But what could disturb the brachiopods? Perhaps jellylike swimming things whose soft bodies were not preserved. More probably, crawling sea worms came near—cousins of those whose burrows are found in rocks of somewhat greater age. Such burrows, now filled with hard sand, show where creatures burrowed and fed though the worms themselves disappeared when they died three eras ago.

BRACHIOPODS IN FOSSIL FORM

They seem to be the oldest shells known from North America. They date to the Proterozoic Era, 600,000,000 years ago

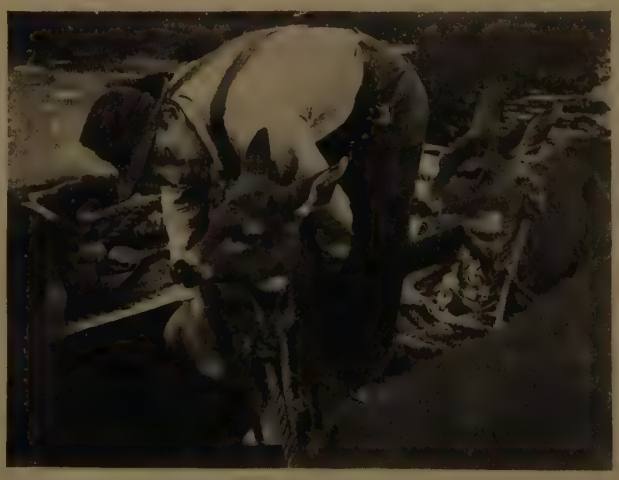
Fossil animals of such great age are rare, especially in America. Australia is more generous. Not far from the city of Adelaide remains of shells and sea scorpions are found in rocks of early Proterozoic seas. Though some were small, others were large, looking much like spike-tailed crabs whose pincers had neglected to grow. Crawling about on the mud, they kept away from the huge, jointed worms that often invaded their pools. Those worms were true "giants of old," dwarfing the humble burrowers in Montana's early seas.

Those early seas were not lukewarm, as early geologists supposed. The Atlantic near New England today compares with the bay where our shellfish lived six hundred million years ago. The Australian fossils are older by far, yet they lie below beds of rock deposited by glacial ice. The earth was then as it has been since: sometimes warm, sometimes cold, and never so hot that the air was filled with clouds of steam rising from recently molten lands. If the earth ever was molten at all, it had had a billion years to cool ere sea scorpions lived in the Adelaide Sea. That glaciers appeared on the bed of that sea proves that the climate could, and did, grow cold.

HOW FAR CAN A DEER SWIM?

BY SIMEON OSTERMEIER

FOR DEER to swim a mile or two, when chased by enemies, is common, but I have reason to believe that they swim, or attempt to swim, much greater distances. One day last winter I was going north from Ketchikan, Alaska, to a peninsula of the mainland. Halfway across the arm of salt water which separates Revillagigedo Island—on which Ketchikan is situated—from the mainland, we overtook three deer swimming toward the peninsula. At this point it was between eight and ten miles from shore to shore. My friend shut off the engine of the tug boat and allowed it to drift towards the deer. They swam at once toward us. They came direct for the stern, which lay low on the water, and tried to climb aboard. So we grabbed each deer and drew it without a struggle on the deck. They were exhausted. They sprawled, panting horribly. There were two does and one spiked buck. It was nearly an hour before one recovered enough to stand up. To prevent their taking to the water too soon, we put rope around their necks. By the time we reached our home float, all three were on their feet, but showing no fight whatever. We untied the ropes. With one accord they leaped into the water, made for the nearby shore, and a moment later they had disappeared in the bush, waving their tails.



THEY WERE FOUND FAR FROM SHORE

The deer swimmers were tied with ropes so they would not take to the water too soon for their good

BUFFALO—A VERB

BY SMITH RILEY

THROUGHOUT available literature dealing with the American bison there is constant reiteration of the dangerous and treacherous character of these beasts as one of the few wild animals requiring constant vigilance under all circumstances. Mr. Ernest Seton goes so far as to say the buffalo are the only really dangerous wild animals of North America. He states that at all times and places, the buffalo, male or female, old or young, are savage, treacherous animals; always a menace to man and beast. There are cases on record where men have been killed by buffalo in captivity. One famous case of this kind is that of a rancher of Henry's Lake, Idaho, who was exceedingly fond of training wild animals in his possession. He had a bunch of buffalo, and one of the bulls was broken to ride and had been ridden scores of times without saddle or halter. This ranchman is said to have felt he could confidently trust the animal, which one day rushed upon him without warning and so impaled him upon one of its horns that it was necessary to shoot the buffalo to remove the ranchman's lifeless body.

This indomitable spirit of the buffalo has eliminated the possibility of its domestication. Anyone who has watched the actions of these animals taken young and broken to drive can well understand this, as they never give up, but appear to be in readiness to use their last ounce of strength in a struggle, or their first ounce gained after resting, to the end of freedom from control.

It seems hardly just to apply the term treacherous to such a nature, as this implies the apparent assumption of submission and then a sudden breaking forth after controlling alertness has been lulled into inactivity. I have never yet seen the buffalo, either male or female, old or young, showing anything but a keen readiness to resent and combat control. I recall seeing a yearling bull separated from a small herd to be crated and shipped to South America. The bull was in an enclosure fenced with woven wire eight feet in height and of number nine gauge. The enclosure was just large enough to allow the animal sufficient run to throw its full weight against the fence and this it did time after time, striking the wire well up towards the top, to be thrown back by the recoil only to get up and make another rush. After repeated rushes the wire gave through the staples on a corner post and sagged at each impact. The bull appeared to sense this and renewed its efforts until the fence offered little obstacle to progress, and he was finally freed.

The buffalo spirit is portrayed in numerous records of the progress over the Plains of the large herds undisturbed by obstacles often causing extensive losses. There are accounts of trains stopped by the herds, and the countless numbers lost through soft ice where the animals headed into rivers in early spring, or where overcome by plains fires. Again this spirit is shown in the descriptions of the desperate fighting when the herd bulls were deposed.

With this spirit there is the inclination to attempt to sweep the field with a determined rush and a great show of belligerence. The swiftness and ferocity of such rushes are a never ending surprise to one judging buffalo by their otherwise slow movements. When an aroused buffalo lowers its head and slowly raises its absurdly diminutive tail, those reading the signs aright know it is well to give ground and wait until the momentary courageous fury has been consumed in quick action.

What might be called buffalo "tactics" have been found effective in developing methods of control. A forest supervisor, having many years of experience, stoutly maintained the only successful plan for handling buffalo was to approach them as though you intended to annihilate them, or "to eat them alive" as he expressed it. Quick, determined action has been found effective, although it is well to be keenly alert to the state of the temper of the animal and to know how far to carry such bluffs or attempts to "buffalo" the buffalo.

This inclination to attempt to dominate by a quick rush and a show of hostility is apparent in all the animals of both sexes and of all ages. Three very young buffalo calves had been brought in on the Montana National Bison Range to be raised on cow's milk. They were confined in a small enclosure near the barn. One morning while milking, the range protector heard a commotion in the calf pen and his small daughter crying. As he rushed out he beheld Rachel, in a tearful state, crawling from under the fence of the calf enclosure, and when asked what was the matter his small daughter replied: "That calf, he sneezed at me." Evidently, the little girl, in passing through to reach her father, had been "buffaloed" by one of the small calves resenting her presence.

In making the intimidating rushes the buffalo often accompany the movement with a throaty grunt or snort which adds much to the general fearsomeness of the approach, although it may serve to stimulate the courage of the charger just as the utterance of sound does to

many different kinds of animals in like circumstances.

It is said that Americans have perfected the art of bluff. This ability may have come as an inheritance of the land once the wide range of the bison. Perhaps this now vanishing race so impressed the founders of an empire with their tactics as to instill a nation-wide trait. In any event, they added a verb to American English.

The Chief Bibliographer of the Library of Congress, states: "In the list of words from Northwest Arkansas, printed in Vol. 3 of *Dialect Notes*, published by the American Dialect Society, we find the following: buffalo, *v. tr.* To frighten off. They have him *buffaloed*. Rare."

In Vol. 4 of the same publication, in a word-list from the Northwest, we find the following:

"buffalo, *v. t.* To cheat; bamboozle. The traders *buffaloed* the Indians out of their furs. He's got them *buffaloed*." Many learned that verb well in recent years.

Professor W. A. Cragie, University of Chicago, Director of Research in the work on the proposed *Historical Dictionary of the English Language in America*, states: "The earliest instance of 'buffalo' as a verb which I have at present is the following:

"*New York Evening Post* October 25, 1904, p. 10. 'All the rest (of the newspapers) were what we used to term in the Southwest "buffaloed" by the McKinley myth—that is, silenced by the fear of incurring the resentment of people taught to regard McKinley as a saint.'

"From that date the word appears to have been in frequent use, although it is not recorded in the Supplement of the Century Dictionary (1909), or the latest edition of Webster (1928)."

A VINE OF THE SHENANDOAH

BY ALLEN MUSSAEUS

You will readily perceive that there is one pair of twins in this picture, but you may not be so quick to recognize the other. They are the vine and the oak, differing from the little girls in that they are aged, but there is not much difference in their sizes and they grew up together. The grape-vine, probably a king of its kind, is a wild variety and is four feet in circumference. It grows in a cool, secluded nook on a Virginia estate, close to the northern entrance to the new Shenandoah National Park.

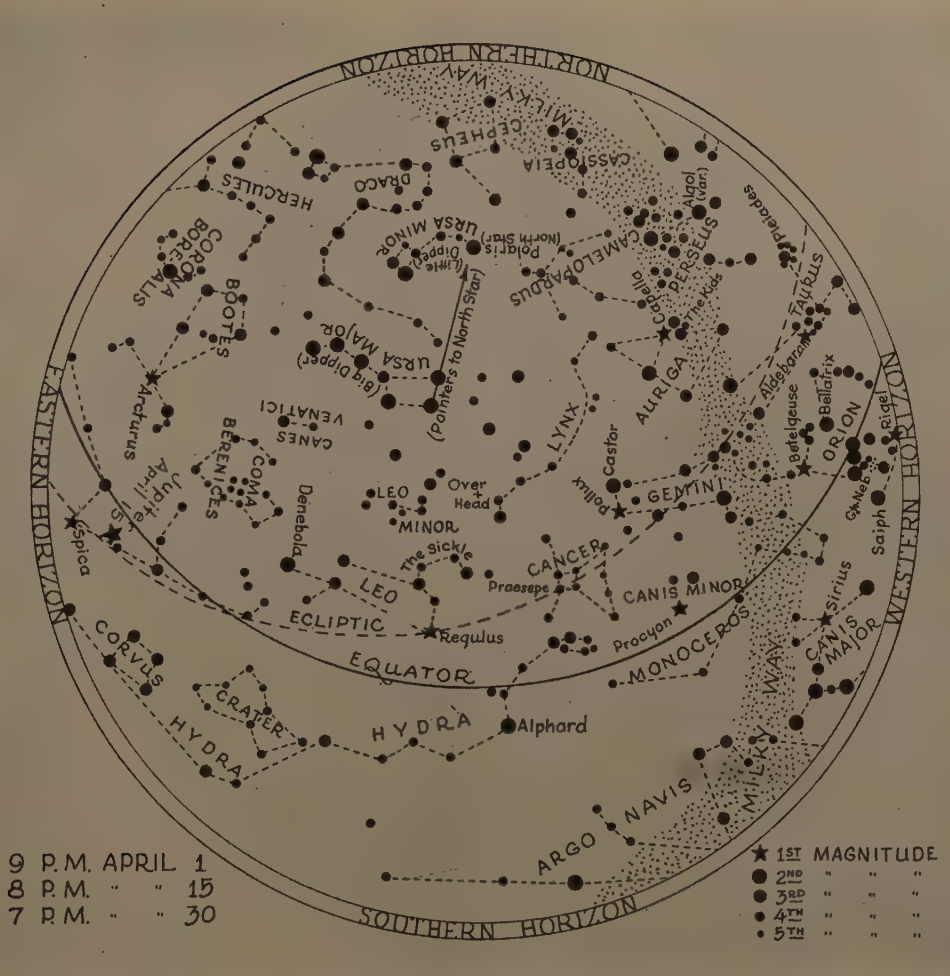
A STUDY OF YOUTH AND AGE PHOTOGRAPH BY A. N. CARROLL

The owner of the vine that twines through the oak would be interested in hearing of other vines which may compete with it in size

The far-reaching branches of this grape-vine clamber over at least four large trees besides the one they first embraced. This is a white oak, and it is plain that it has been made to conform in its growth largely to the whims of its companion. Both the oak's trunk and branches are curiously twisted and vine-like.

Shaded by the tree and vine, and, no doubt, accounting for the longevity and immensity of the vine, is a slow-trickling spring of excellent cold water, whose flow no drought has been known to slacken. The spot has witnessed many an intimate and memorable scene. In the days before the War between the States the Negro slaves belonging to the father of the present owner of the estate would come here from corn-field and kitchen to quench their thirst, "fetch up" buckets of water to the house, gossip, tell ghost stories, or dream of future freedom and "a dollar a day." It would be hard to tell how many of the officers and rankers of Mosby's and Jackson's, or, even, of the Union armies reposed later beneath the out-spreading branches of the vine-canopied oak. Then, in the years when civil strife was no more, the refuge continued to harbor many a weary and thirsty soul of varied complexion and degree, as well as many a lusty and clamorous youngster, sporting merrily in the rope-like natural swings that dangled from high places. In autumn nights the gnarled and drooping branches of tree and vine would sometimes be lit up weirdly by flames that flickered and flared beneath caldrons of sorghum or sputtering apple-butter.

And now come, with all the ebullience of life's springtime, these three representatives of the world of tomorrow. The twins, with their husky little brother, who nestle so contentedly among the shaggy coils of the giant vine, are the children of Mr. J. D. Cockey, chief of a party of engineers who made a location survey of a scenic drive in the Shenandoah National Park near here.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south

THE GREATER BEAR NOW RIDES HIGH

BY ISABEL M. LEWIS

THE BEST known of all northern star-groups, The Big Dipper, is merely a portion of the great constellation of Ursa Major, or The Greater Bear, which never disappears below the horizon in the mid-latitudes of the northern hemisphere, although it is seen to the best advantage in the evening hours in spring when it lies above the pole.

The bowl of the Big Dipper is the body of the Bear. The three stars in the handle outline the tail. Southwest of the bowl are three pairs of stars of third and fourth magnitude, the members of each pair only about two degrees apart. These three pairs mark three of the Bear's feet. The curved line of stars of third and fourth magnitude west of the bowl of the Dipper outline the muzzle, breast and fore-knees of Ursa Major. The body, outlined by the bowl of the Dipper, occupies hardly one-fourth of the region covered by the entire constellation. The tail, according to the amusing story told by Thomas Hood, owes its exceptional length to the fact that Jupiter, Ruler of the Heavens, to avoid the teeth of Ursa Major lifted her to heaven by her tail which, as the Bear was of great weight, was greatly stretched thereby! To the American Indians the three stars in the tail were The Three Hunters or The Hunter with his Two Dogs. In England they were also The Oxen, and the four stars in the bowl of the Dipper were The Plough, or Charles' Wain, names which have continued in use even down to the present time.

The seven stars of the Big Dipper are known by their Arabic names as well as by the Greek letters used in conjunction with the name of the constellation, which is the more common designation for the principal stars in a constellation. Because these stars are of exceptional interest it may be worth while to remember both their Greek and Arabic names. The far-famed Pointers of the Big Dipper are Alpha and Beta Ursae Majoris, the more

northerly of the two being Alpha. They are also, respectively, Dubhe and Merak. The word Dubhe is an abbreviation for the Arabic phrase meaning Back of the Greater Bear and Merak means the Loin. The star at the junction of the bowl with the handle is Delta Ursae Majoris, or Megrez, which is Arabic for Root of the Tail. The star in the bowl below Delta, or Megrez, is Gamma Ursae Majoris, or Phecda, which is Arabic for Thigh. The star in the handle nearest to the bowl is Epsilon Ursae Majoris, or Alioth. Next, at the bend in the handle of the Dipper, is Zeta Ursae Majoris, or Mizar. Close by Mizar forming a wide naked-eye double with it is Alcor, Arabic for The Test. These two are also known as The Horse and His Rider, or Jack on the Middle Horse. The Arabs, it was said, considered ability to separate these two stars a test of keen vision. Mizar is also a fine telescopic double star. It was the first telescopic double to be discovered—in the year 1650. At the end of the handle of the Dipper is Eta Ursae Majoris, or Alkaid. If one is familiar with the Greek alphabet the Greek names of these seven stars are easily remembered because beginning with Alpha at the top of the bowl and farthest from the handle and passing to Beta, the star directly below it, and from there on in order to each star ending with Eta, at the end of the handle, the names follow in the order in which the letters come in the alphabet.

The brightest of the seven stars is Alioth, which, we recall, is in the handle nearest the star Megrez, or Delta, which is the only third magnitude star in the Dipper and the faintest of the seven stars. Alpha and Eta, the two stars farthest apart, are almost exactly equal in brightness. Alpha is standard second magnitude, Eta only a tenth of a magnitude brighter. Beta and Gamma at the base of the bowl are also almost exactly equal in brightness, Gamma is two and one-half magnitude. Beta, and also Mizar, which is equal to it in brightness, is only a tenth brighter than Gamma. It is helpful to know the magnitudes of these stars as reference stars in estimating the brightness of others. The stars of the Big Dipper also furnish a convenient scale for measuring the *angular* distance between stars which is the only way in which we can estimate how far apart celestial objects appear to be. The distance between the two Pointers of the Big Dipper is five degrees. The distance across the top of the bowl from Alpha to Delta is ten degrees. Eta at the end of the handle is twenty-six degrees from Alpha, which is the entire extent of the Big Dipper. As is well known, a line extended upward through the Pointers, Alpha and Beta, a distance about equal to the length of the Dipper, brings us to Polaris, or the North Star. Also a line drawn from Zeta, or Mizar, through Eta, at the end of the handle, and extended a distance also approximately equal to the extent of the Dipper brings us to the brilliant, orange-red Arcturus, in Bootes. So we have, after all, two Pointers instead of one among the seven stars of the Big Dipper.

Five of the seven stars of the Big Dipper form a moving cluster. That is, they are moving across the heavens in the same general direction and at the same speed. Their present distance from the solar system is about seventy or eighty light years. This cluster is the nearest to the earth of all the moving clusters and other stars in different parts of the sky are members of the same cluster, notably Sirius. In fact, our own sun, which is not a member of the cluster, is in the midst of it, and it is for this reason that many of its members appear to be so widely separated. The two stars Eta and Alpha Majoris are not members of the Ursa Major cluster and are both moving in the same direction and opposite to that of the other five stars. Yet so slow is the motion of the stars relative to each other that after fifty thousand years have passed the seven stars of the Big Dipper will roughly still form the outlines of a Dipper. The handle will be a little more bent and the outlines of the bowl less pleasing, but still it will be recognizable as a Dipper—granted that the human race then exists and still has an acquaintance with Dippers.

In April another annual shower of meteors, The Lyrids, is due to appear. They come, as their name indicates, from the direction of the constellation of Lyra and though they may be seen any time between April 16 and 22, the greatest display is expected on April 21. They should appear in greatest numbers after midnight as Lyra crosses the meridian at that time of the month about 4 A.M. The Lyrids are swift and leave bluish streaks.

There will be an occultation of the planet Venus by the moon on April 10, visible in parts of the Atlantic Ocean, and in parts of Europe in daylight, but it will not be seen in the United States as the planet will be at the time either below the horizon or too close to it to be seen, or other circumstances will be unfavorable. The planet will be seen close to the moon on that date, however, in the eastern part of the country, early in the morning before sunrise. Venus reaches its greatest western elongation on April 16 and will be seen in the southeastern sky before sunrise throughout the month. Mercury reaches its greatest western elongation on April 2, when it will be low in the east before sunrise; but spring is not a favorable time of year to see this planet in the morning hours as the ecliptic then makes a small angle with the eastern horizon.

Mars will be in conjunction with the sun on April 14 and will be too close to the sun to be seen throughout the month. Jupiter is in fine position to observe this month. On April 8 it will be in opposition to the sun and will rise at sunset and be visible all night. It is in the constellation of Virgo a few degrees northwest of Spica. Possessors of small telescopes will find the giant planet a fascinating object to observe at this time. Its everchanging belts and the eclipses, occultations and transits of its four, historic satellites make it the most interesting of all the planets to observe through the telescope. Saturn is now in the eastern sky before sunrise. It rises about two hours before the sun and is in the constellation of Aquarius but is not favorably placed for observation.

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BOBBY MEETS A BUNNY AND JUST TAKES A LOOK. HE HAS BEEN TAUGHT NOT TO KILL WHEN HE HAS SUCH A VISITOR BUT IF LEFT ALONE HE WILL BE A REAL BOBCAT AND MAKE A MEAL OF THE BUNNY

ARE WILDCATS WILD?

BY WILLIAM L. FINLEY

PHOTOGRAPHS BY THE AUTHOR

Down the road rumbled a car. It whirled around the bend. I straightened up from my weeding. Swaying and balancing on the hood of the car was a bobcat. The driver jammed on the brakes. The cat jumped lightly off, and Hank McNee stepped out of the car.

"How did you get him so tame?" I asked.

"Well," he said as the big cat rubbed against his leg, "Bobby was taken out of a den in eastern Oregon when he was only a few hours old. He is a part of the family. In fact, he is the only child we have. I've lived and slept with him for four years."

"Slept with him?" I exclaimed.

"Yes, every night. You see, he was such a little kitten in the beginning, and Mrs. McNee and I had to mother him. He was a bottle baby. We tried to keep him under the bed, but he wouldn't stay. He used to crawl in with us, and now he won't sleep anywhere else."

"A full grown bobcat is a strange bed-fellow," I suggested.

"Yes, but he is as gentle as a tame kitten. When Bobby was young, he didn't get raw meat because we thought it would make him savage. One evening he sneaked out and didn't appear at bedtime. Finally we went to bed and left the door open. Along toward morning, I felt something jump on the bed. There was Bobby with a big hen. He laid it on the pillow. I talked with him and

BOBBY WILL PLAY AND BOX WITH HANK, FIGHTING AND SNARLING BUT ALL THE TIME HE WILL KEEP HIS CLAWS SHEATHED AND WHEN THE BATTLE IS OVER WILL RUB HANK'S CHEEK AND KISS HIM

spanked him, but couldn't teach him to let chickens alone. It has cost me a good many dollars for neighbors' hens. However, I can hold a chicken or a rabbit within a few inches of his nose, and he has learned to obey and not touch it. One day he killed a dog. Since then I've kept a collar on his neck and led him around."

"But cats are naturally afraid of dogs," I said.

"Yes," answered McNee, "that's because man has always carried weapons and the dog has been his companion. If men had always had bobcats instead of dogs, the cats would have cleaned out the dogs. They are quicker in action and have fangs and claws that are more deadly.

"Once at an auto camp in Los Angeles, a stranger came up with a bulldog that sniffed around the car. I suggested he'd better call his dog.

"Says he, 'He won't hurt anything.'

"Says I, 'Well, there's a cat in there that might hurt him.'

" 'Nonsense.' He wouldn't let the dog hurt the cat.

"Bobby was lying on the bed rolls. The dog, with his feet on the running-board, was puzzled about cat smell. Then Bobby landed. There was just a blur of a cat and a scratched-bitten-clawed dog. Away went the bull, kicking gravel at every jump.

"We never have to worry about people stealing things out of the car. It would be too much like touching a match to a can of powder.

"The reason Bobby got to riding on the hood of the car was because we live out in the sage-brush where jack-rabbits are thick. He likes to ride where he can see. When a jack starts up the road or jumps for cover, Bobby likes nothing better than to pick him up in a flying leap."

I could see that this cat was a one-man animal. He ignored everyone except his master. No one seemed anxious to get near enough to disturb his dignity.

"No one else could take such liberties with him," I said, as McNee picked the big cat up in his arms.

"No, I guess not," he replied. "He's all for me, and he's got a streak of jealousy that's deeper than any pet I ever had. There's no use of my trying to keep any other pet. One day we were traveling and Bobby was hungry. I came to a place where a man had some Belgian hares and I bought a young one for Bobby's dinner. It was so tame I took a fancy to it. We kept it in the car for nearly a month. Bobby didn't pay much attention to it at first. One day when I was away, the rabbit was in a little place under the luggage in the car. When I returned, Bobby had dug down and pulled him out through the crack. The bunny lay dead in the seat.

"Later I thought I would cure his jealousy by getting some animal like a wolf or coyote pup that would be quick enough to hold its own. A man gave me a young coyote, and I kept him around where the two could get acquainted. When I petted or played with the coyote, Bobby would growl. His leash, however, kept him at a safe distance. He bided his time until one day there was just slack enough in the chain for him to leap for the coyote before he could be jerked back. In the wink of an eye, he had sunk his fangs into it just behind an ear. Within three minutes, the pup breathed his last."

Then McNee began to box and wrestle with

Bobby. The cat snarled and growled like a demon. He slapped back, but his claws were sheathed. Suddenly, McNee put his face down, and the cat licked it and rubbed against his cheek. Then McNee hauled out a paper and unrolled a two-pound chunk of raw meat. He held it in his hand and the cat gnawed off a little at a time. He was careful not to bite fingers and was gentler than a house cat.

This wildcat or lynx is not the ancestor of Tabby, the household pet. The kitty that likes to take a nap in your lap comes from early Egyptian times. Being made a pet has brought a wide change in color and looks. But the gap is not wide between the house cat and the bobcat. A tame pussy will go back to the wild if not given care. Centuries as a pet do not matter. Man has always been the enemy of the bobcat. Yet in one generation, Hank McNee had taken a bobcat and, through gentleness and human companionship, the animal had developed into a trusted and reliable pet. Was this gentle, trust-worthy wildcat wild?

HANK PUTS ON A FUR HAT BUT IT IS A LIVE ONE AND WOULD BE LITTLE USE ON A COLD DAY

That may be a hard question to answer. There is no rule by which to answer it. I have had many wild pets myself. They have ranged all the way from a California quail to a white coyote. The little quail lived all but two days of his long life with me. Our home was his home. Our family was his family. He never was kept in a cage but lived in the library and roamed in the garden. He never seemed to care about going back to the wild. He was surely the least wild of any of my many pets. Yet he was a wild bird from generations of wild birds. It may have been that the call to the wild in him was not as strong as it is in most wild animals. It may be that he would have answered such a call had it been strong enough. Most wild animal pets will answer it. Most of them still have much wildness in their nature. It is not often that they are truly tamed to become domestic companions, but a real desire to know them will do much as it did with Bobby.

THE RAINBOW IS ROUND

BY FLORENCE H. MOORE

At the end of the rainbow,
So the story is told,
For those who may find it,
Is a big pot of gold.

But how can that be—
Does anyone know?
For the rainbow is round—
Yes, indeed, that is so.

It truly is round;
Now please do not laugh,
Although from the Earth,
It looks cut in half.

But flying high in the sky,
Air pilots have found
The lower half of the circle,
Which proves it is round.

PUZZLE: Find the pilot and his mascot, the parrot.

Cornell Leaflets

Many will be pleased to know that it is now possible to obtain the splendid Cornell Rural School Leaflets outside the borders of the Empire State. Hitherto it has been an exclusively New York proposition, but it is now possible to subscribe to the Leaflets for one year. The four issues of the year will be sent postpaid anywhere in the United States for a fifty-cent subscription, or the three children's numbers will be sent for thirty cents. This publication has been an invaluable aid to the teachers in New York for twenty-six years and it is fortunate that its scope may thus be enlarged. Subscriptions may be sent to The Cornell Rural School Leaflet, Cornell University, Ithaca, New York.

Strange Fishes

There are a lot of odd citizens of the sea and some of these are dealt with in picture and text by Paul W. Kearney in his book, *Strange Fishes and Their Strange Neighbors*. This book is almost as good as a visit to an aquarium and is something one would like to have after having made such a visit. The pictures are excellent and the text concise and popular as well as authentic. We do not believe that the book has a counterpart. It is published by Doubleday, Doran and Company and sells for $1.25.

Children's Fair

"Real first-hand experience with the phenomena of Nature is the most fruitful if not the only basis for continuing mental growth," declared Dr. Morris Meister in an address at the dinner which preceded the judging of the exhibits at the annual Children's Science Fair. The Fair this year was the most successful yet, a wide variety of exhibits being displayed by the various entrant groups. This activity is sponsored by the American Institute and held at and in cooperation with the American Museum of Natural History. Prizes totalling $2,650 were awarded in various classes, these awards to be devoted to the purchase of scientific books or equipment.

Wisconsin Program

Following its biennial council meeting, the Wisconsin Federation of Women's Clubs is going forward with new vigor on its conservation program. One item particularly emphasized is that of regional planning as a means of assuring the wise future development of the State. The Federation is also working for reduction of the open season on deer from ten to five days; local or county option on the proposed opening of the season on the bear; restriction of the use of high-powered rifles; protection of the beaver, now threatened with an open season. An active educational campaign in the schools is also planned.

Birds of Atlanta

Georgians will be much interested in the booklet entitled *Birds of the Atlanta, Georgia, Area* by Earle R. Green. This is published as its Bulletin No. 2 by the Georgia Society of Naturalists. The brochure deals with the distribution, migration and nesting of birds of the region. It contains some most interesting records, making its appeal more than purely local. The booklet is available at one dollar a copy from P. W. Fattig, Curator-Librarian, Emory University, Georgia.

Owls Turn Urban

By Frank W. Sutton

Near West Liberty, Iowa, there are several tracts of timber. One of these joins the town on the east and borders on United States Highway No. 6. In this piece of woods a colony of great horned owls make their home. Even though it is so near town they live there the year round, nesting there during the spring also. The people who live on the farm on which the timber is say they often hear the owls, not only at night but also in the daytime of late afternoons if the sky happens to be cloudy. In fact, it is not uncommon to hear them from in town also. They are seldom seen, however.

I have been living in the town for five years and have often heard the owls hooting. Not only have I heard them from their haunts in the woods but a number of times they have come up into the residence districts of the town in the middle of the night and alighting in the tall trees have made the night ring with their hootings and other calls that they make at times. One of their calls sounds as though they were trying to imitate a man laughing. A time or two they have been in the trees in front of the house where I live. I have tried to see them but at the slightest noise they take flight.

But the most unusual occurrence in connection with them happened recently. Between eight and nine o'clock in the evening I heard the owls begin to hoot. They were in a tall maple tree in front of the house next door to where we live. There were at least two of them, if not three, and one of them was giving the call that sounds like a man laughing. I went quietly out into the yard and listened but was unable to see them.

While they are known as being such shy birds they were in this tree in town while people were passing under the tree on the sidewalk and cars were passing along the street also, as it is quite a busy street. After a few minutes there they took flight so noiselessly that I could not tell when they left.

Since then I was on the street one evening about sundown of a cloudy day and happened to see a large bird flying toward me. It lit in a tree near my home and investigation revealed that it was one of the horned owls. It remained there until I was under the tree before taking flight.

Bobwhite's Mistake

By Bessie L. Putnam

Early in November, as a long distance bus was on the road just south of Erie, Pa., the driver was startled by a loud crash followed by the screams of a woman in the seat just back of him. Stopping the bus, he found himself surrounded by broken glass from a shattered plate glass window. "That's what did it," said the woman, pointing to a seemingly lifeless bobwhite lying on the floor. The driver tossed the bird out of the window; then gathering up the broken glass, he carried it across the pavement. As he passed the bird he noticed a slight movement. He stopped to examine it and Bob turned his head slightly. Finally he set it upon its feet, when it suddenly took wing and was away, evidently less harmed than the woman who had a bad bump on her face as a result of the impact.

A Threadwaisted Wasp

By Lawrence Berry, Jr.

While returning from a wild flower hunt, I chanced to pause for a moment on a hard clay path joining the units of Camp Manatoc, Boy Scout Camp at Peninsula, Ohio. Here I witnessed one of the most dramatic incidents of a wasp's life. On the trail lay a cutworm, not in its natural crawling position but on its side. Near it lay a small pile of dirt, and a small round hole near the pile solved the mystery of that pile. Being extremely interested in the tableau before me, I lay on the ground nearby and watched for the next act.

In a few minutes a threadwaisted wasp, *Sphex urnaria,* emerged from the hole with a piece of clay clutched between her mandibles and forefeet. She deposited this bit on the pile which I had noticed first. Having completed moving the dirt, the wasp straddled the worm, grabbed him in the back with her mandibles and dragged him to the hole. The wasp then reversed her position and backed into the hole; immediately grasped Mr. Worm again and pulled him out of sight. About a minute elapsed before the wasp put in her appearance again, and, apparently dissatisfied with the situation, pulled the worm out of the hole.

The wasp began a deeper excavation of the hole. This time, before she buried Mr. Worm, the wasp made a small survey of the territory near the hole to determine if all was under control. The second time that the worm was dragged into the hole the wasp did not pull it out but began immediately the task of filling the hole. Her manner of doing this was peculiar, to say the least.

First, she took several lumps of clay to the hole, then stood on her head while, with a circular pushing motion of that appendage, she pulverized and packed the soil solidly into the hole. This process was repeated many times until the hole was filled to the level of the surrounding ground. With every pushing motion a high drone or buzz accompanied the operation. The sound reminded one of a buzz saw cutting through a knot.

Several times during the filling of the hole, insects would fly or run close by the scene of operations. Each time the wasp would crouch in a menacing fashion or would even run at the offenders and send them scurrying away. The operation of filling the hole being completed, Mrs. Wasp began to bring small bits of straw and sticks to camouflage the hole. When this was completed Mrs. Wasp flew merrily on her way, and, although I waited for quite some time she did not return again. The cutworm that had been buried was one of the paralyzed victims with which this genus of wasps stock their underground cells, to provide food for the young that will hatch from the eggs deposited at the same time.

Yosemite School

When the Yosemite School of Field Natural History goes into session on June 25 it will mark the tenth annual session of this notable activity in Nature education. The session will extend to August 10 and applications are now being received. The school is definitely set up to train for naturalist work in our National Parks, but the course is also valuable to those interested in the fields of Nature guiding, Nature councilling, conservation, or in field methods in natural science teaching. Meeting in Yosemite, the opportunity for field work is varied, and the nine-day pack trip which climaxes the course is a notable feature. The classes are limited to twenty, and an admission prerequisite is three years of college work or its equivalent with a background in science. Applications and information may be obtained from C. A. Harwell, Park Naturalist, Yosemite National Park, California.

Feeding a Redbird

"A pair of redbirds," writes Helen Pelton of Rockwell, Texas, "had built a nest in a bois d'arc tree in the yard and early one morning I found a helpless-looking baby redbird in the garden barely feathered out. As he seemed weak and hungry I carried him into the house and offered him whole-wheat bread. This he surveyed indifferently. Taking a piece of bread in my hand I made a quick swooping movement with my arm like the mother bird makes when coming to the nest and his mouth popped open. This way I gave him all the bread that he wanted and a few worms that I found in the garden. Then he was taken back to the garden and placed under a bush. When I saw him again several weeks later he was well feathered-out. He was accompanied by his parents who had come to the glass bowl in the pepperwood tree for a drink and a bath."

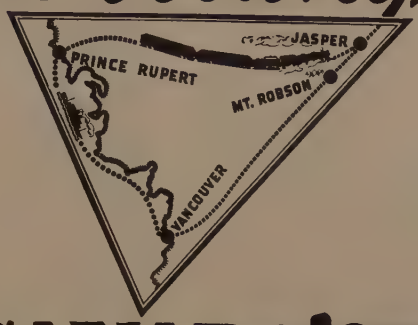
Roosevelt Bulletin

Roosevelt Wild Life Bulletin, Volume 6, Number 2, originating with the Roosevelt Wild Life Forest Experiment Station and published by the New York State College of Forestry at Syracuse University, is devoted to the white-tailed deer of the Adirondacks. It is a splendid and comprehensive piece of work done by M. T. Townsend and M. W. Smith, field naturalists of the Station. The Bulletin comprises 385 pages, plus maps, is well illustrated and of marked mammalogical and conservation interest.

Summer Session

Again this year a summer session will be held at the Biological Station of the University of Michigan on the Bogardus Tract. As usual an excellent program has been formulated under notable faculty direction. The 1934 session extends from June 25 to August 18. Information may be obtained from the University of Michigan, Ann Arbor, Michigan.

"the triangle tour"



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Nature as It Used to Be

There are no doubt many lovers of Nature's out of doors who think a bit wistfully at times of the years gone by when our country was in primeval forest and was inhabited only by the wandering red men, or, again, of the somewhat later time when the sturdy pioneers along the eastern seaboard began steadily to push forward and westward along its frontier into newer areas and greater adventures—and probably such people have speculated over the wonderful opportunities our forefathers had to study all the things of Nature under conditions very nearly ideal. All these folk will welcome Grant Foreman's new book *Advancing the Frontier 1830-1860* (University of Oklahoma Press, Norman, $4.00), for to its readers the old days again will return; the Osages, the Choctaws, the Cherokees, the Creeks, the Chickasaws, and the Comanches will reappear; Forts Gibson, Wayne, Towson and Arbuckle again will be more than names and memories; the settlers, the hunters, the trappers, the missionaries, and others who wrestled with Nature, and the flotsam and jetsam of the American outposts once more will pass in review. Best of all to an imaginative soul, the forest, the rivers, the hills, the prairies, and the living things thereon could be made to reappear in a light that never was on sea or land—in the glory and the romance of things as they used to be. A memorable book! Significant and brilliant!

A Different Beaver

A family of beavers had made their home under the famous Fishing Bridge in Yellowstone National Park, writes F. Sheldon Bart of the Hellroaring Ranger Station, and included one member who was different in the use of his paws. The family consisted of a male, female and three kits.

"One winter day," Mr. Bart reports, "while observing the entire family having lunch upon their food pile, I noticed that the two old beavers and two of the kittens would grasp their willow sticks in their left forepaws, bring the stick to the left side of their mouths and begin gnawing off the bark. As the end of the gnawed stick protruded on the opposite side of the mouth it was grasped by the right forepaw. The third kitten reversed the process by picking up the twig with his right paw and bringing it up to the right side of its mouth and took over with his left paw as his meal progressed. He continued to do this for the half hour I watched, and the rest of his family stuck to their ways, also."

About the Cumberland

An interesting booklet for Nature lovers whose trails may lead into the Cumberland Mountains is *Outdoors in the Cumberlands* written and published by members of the Cumberlands Hiking Club under the editorship of Robert Sparks Walker. The pamphlet of 56 pages is a popular guide to the geology, flora and fauna and trails of that region. Copies are available at twenty-five cents each from the Cumberlands Hiking Club, 808 Greenwood Avenue, Chattanooga, Tennessee.

THE PRESIDENT'S COMMITTEE ON WILD LIFE RESTORATION

(Continued from page 157)

advise in the selection, improvement and administration of refuges. By a provision in this bill, a new advisory board, to confer with the Secretary of Agriculture in connection with the administration of the Migratory Bird Treaty Act, was proposed. The Shell Tax Bill, as stated, did not pass, but the Advisory Board was reorganized. This bill was prepared for and sponsored by the "More Game Birds" organization, and we regret that we cannot regard any measures sponsored by this organization as beyond suspicion.

The American Nature Association favors the acquisition and maintenance of inviolate refuges, but it has no faith that real protection of our harassed waterfowl will result from the expenditure of money gained by a tax on ammunition, or by a stamp to be paid for by the hunter. It believes that the proposed stamp tax is the virtual successor of the shell tax, and that the birds would suffer rather than benefit by its adoption. There is already appearing evidence that the adoption of the one-dollar stamp tax will be followed by demands for greater killing privileges. Therefore, the Association does not favor, unqualifiably, the acquisition of waterfowl refuges that must be financed by such money. We believe that the Biological Survey, by reason of its long study of the wild life, is better qualified to preside over its destinies, especially if it be free from political interference, than can any unwieldy inter-department organization. We further consider that certain aspersions cast on the Survey's former administration of migratory waterfowl in this report are unjustified.

Hotel Birds

When Miss R. Bertha Preston of Jamestown, New York, moved to a downtown hotel to live she felt that she was saying goodbye to bird friends she had been accustomed to feed. Certainly the seventh floor would not be a place to expect bird visitors. But she started by throwing food on the roof of a low building across the alley. Birds came. Finally they came to her window sill, and last year she brought up five families of robins there, now and then some of them coming into the room for a bite to eat. Miss Preston could watch the mother bird go off two blacks to the nearest tree and come back with food for her offspring. When they were large enough to fly, the mother would bring them to Miss Preston's window sill. There she fed them. They ate more than thirty pounds of the small seedless raisins last year.

Using Silhouettes

Cutting out the silhouettes in our August issue, Miss Laura L. Bernhardt of Cincinnati glued them on a cedar block, applied one coat of shellac and one of varnish and had a door stop. She says that the result is something that is better looking than the baskets of flowers so often used. Miss Bernhardt adds that "the barrel is turned upside down and some of the beautiful things of bygone days come back," including quilts and silhouettes.

A Summer Tragedy

By Fred P. Hutchinson

My story really begins with the building of a bird house that was said to satisfy in every detail our little friend, Jenny Wren. When it was finished and had been nailed to a post in the grape-vine trellis, I decided I had done my part and it was now up to the wren family to take possession. But I could hardly believe my eyes when the very next morning I saw a pair of wrens collecting material for a nest.

Then, of course, the interests of these two birds became a part of our family life, being so near to the pantry window that we could see and hear them at all times. Almost every morning before leaving for the office I would find myself looking out of the window to see if all was well with the wren family. One morning I was surprised to see the father bird flying frantically from the bird house with a feather, which he dropped while in flight. Circling in the air, he returned to the house and repeated the action, keeping at it for some time bringing out the different materials which had been used in building the nest. I decided that the Mrs. had found fault with the interior decorations and that the father bird was simply cleaning house for a new start.

Every morning would find him singing away and busily engaged hunting along the walls and fence rails for spiders' nests which he took into the house, as I thought, for the little ones when they should appear on the scene. One morning as I looked out of the window it dawned on me that of late I never saw but one bird at a time and on this particular morning not seeing either bird I decided to do a little investigating. No sooner had I approached near to the post on which the house was fastened than like a flash Mr. Wren appeared from some place or other and by his actions I was plainly told to keep away, so I decided that "Jenny" was on the nest, being just one of those "stay-at-home" kind of mothers.

The nights were getting too cool for comfort and then one day I realized he was gone—some of his brothers doubtless came along and coaxed him to go South with them to spend the winter. So I thought I would clean out the bird house and have it ready for next summer. Getting the step-ladder I proceeded to take off the roof and what do you think I found? There in the nest or rather that part of it that the father bird had been unable to loosen and carry out was the tiny skeleton of his mate, held fast by a tangle of spiders' webs threads and twigs.

The morning I saw him working so hard, no doubt he was doing his best to free her and then when he found he could not, he proceeded to gather food for her and for the whole season not once was out of sight of his "Home."

Exchange Butterflies

Robert Zecher of Norfolk, Connecticut, would like to get in touch with other amateur collectors of butterflies and chrysalids, particularly in Florida and California, so that he can exchange specimens and observations.

MORE NAMES FROM LATIN AND GREEK

Again we present analyses of scientific names of two things described in this issue of Nature Magazine. The analyses are prepared by members of the Latin Junior Scientists' Club of the Abraham Lincoln High School in Brooklyn, New York. The research was done by members of the Club as well as those whose names are signed to the analyses. This month the subjects are the Western Skunk Cabbage (Page 182) and the Black-Necked Stilt (Page 176).

WESTERN SKUNK CABBAGE. *Lysichiton camtschatcense.* The western skunk cabbage is so called from its resemblance to the common skunk cabbage of the eastern and central states. Both are of the Arum family, which has a large spathe, sheathing the head of flowers, that is called the spadix.

The name *Lysichiton* (Greek for a loose or free cloak) probably refers to this spathe, for the *chiton* was a tunic worn by the Athenians, and the western skunk cabbage has its spathe spreading loosely at the base. At first it envelops the spadix, but this later grows out beyond its cloak.

But why *camtschatcense* for a plant found in California, Oregon and Alaska? Linnaeus characterized and named the species from specimens obtained in Siberia, probably on the Kamchatka peninsula. It is interesting that this species, with many others, is found on both the Asiatic and American shores of the North Pacific.

These two Greek roots from which the generic name is formed have proved useful in many other words. *Lysis* means a loosening or setting free, and *chiton* means not only a tunic but also a coat-of-mail, a skin or hull, and a layer of an onion. *Chitonidae* is a family of molluscs that have the body covered with separate overlapping plates which may be regarded as the animal's coat-of-mail. *Chitin* (pronounced ki tin) is substance forming the horny colorless part of fingernails and claws and also the principal part of the hard outer covering of insects, for instance, the wing-cases of the June beetles.

Lysopteri (whose parts mean loose and wing, *pteron*) is the name of an order of fishes that have the middle parts of the fin-rays (as if the fins were wings) not joined to the interneural bones, so that the name carries the idea of looseness. A super family of flycatchers represented by our tyrant flycatchers, Tyrannidae, has been called Lysodactylae, from loose and toe, *dactylus*. When a patient is ill and there is a gradual change for the better, the change is called *lysis*, loosening, instead of *crisis*, where the change is abrupt.

The plant loosestrife is *Lysimachia*, named for the Greek Lysimachus. His name meant loosening strife or putting an end to it, and the plant was supposed to have a soothing effect. The words of Pliny, a Roman naturalist, have been translated by an early English writer: "It is believed to take away strife or debate between ye beasts, even those that are wild, by making them tame and quiet—if it be either put about their yokes or their necks."

Lysol in our modern times (*oleum* oil) is a germicide or disinfectant and oil that loosens the germs.

ETHEL FINK
HENRY HILSENROTH.

ENGLAND
the daily pageant

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BLACK-NECKED STILT—*Himantopus mexicanus*. A boy on stilts is no common sight, but how many of you have ever seen a bird walking on stilts? The black-necked stilt does just that. However, instead of using wooden stilts, it has legs that serve the purpose, for it is a wading bird with extremely long, slender legs. Strangely, the legs are always of some bright tint, lake-red or rose-pink, while the upper parts of the bird are glossy black and the under parts are white.

The scientific name *Himantopus* (pronounced hi mán to pus) describes the legs, too, *himant*—meaning a thin leather strap or thong, and *pus* (from the Greek *pous*) meaning foot. These birds are found in abundance in certain arid parts of the west, but now only rarely and locally in the east. They are confiding birds and have been too easy a prey for the hunters. On the lower part of the legs, or the tibiae, there are no feathers, so that the resemblance to straps of leather is closer.

Several of the stilts have names which prove that the scientific words are not so difficult as they seem, and that they call attention to the distinguishing characteristics. One is *nigricollis*, from the Latin words for black and neck; another, found in the Old World, is *melanopterus*, from the Greek for black and wing (with the word melancholy to help us remember its gloomy color); another, in Australia, is *leucocephalus*, or white-headed; all these roots are found in the names of many common birds and other animals.

We have found two other living things that are named for their resemblance in some way to leather straps,—*Himantolophus* (pronounced hi man tól o phus), a genus of fishes that have a thong-like appendage at the end of a spine on the head; and *Himanthalia*, or sea-thongs, a genus of algae on the coast of England, which have immensely elongated receptacles shaped like straps.

LILLIAN SCHWARTZ
JACK KANSKY
NORMAN LOBEL.

Toledo Naturalists

We recently received a copy of the first annual bulletin of the Toledo Field Naturalists' Association, a mimeographed publication which testifies eloquently to the activity and progress of that organization during the first three years of its existence. The Association has grown through the addition of new members and through consolidation with the Toledo Nature Study Society. One goal set by the organization is the erection of a museum building in the Toledo Zoological Park. For 1934 a splendid program of field trips and lectures is planned. Information may be obtained from Mr. Schunk, Technology Department, Toledo Public Library, Toledo, Ohio.

Flicker and Starling

Confirming the fact that starlings are wont to usurp the homes of flickers, Oliver O. McVeagh of Oil City, Pa., reports observing a battle royal when a family of flickers returned this spring to a nest hole and found it tenanted by starlings. The battle resulted in victory for those who hold that possession gives one an edge on the law, and the flickers went about the hollowing out of a new nest. Mr. McVeagh reports that the starlings kept the nest as clean as do the flickers.

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Or, nearer at hand, our own New England combines snow-capped mountains, lovely valleys, beaches, lakes and Wren steeples with a backdrop of the finest American traditions.

Then to the West meridians past the sunset and into another dawn to greet the land where the sun rises—Japan. No better time than April to set out for a panorama of cherry blossoms, mystic shrines and temples . . . for Japan bows a welcome to all her guests and friends.

If you would journey "abroad" but nearer at home, go to Canada, our nearby neighbor. There is no finer trip than through the Niagara River, Lake Ontario, Thousand Islands, the turbulent rapids of the St. Lawrence, Montreal, Quebec and the Saguenay River.

All information concerning steamship sailings, train connections, travel rates, will be supplied by the Travel Bureau of Nature Magazine, a service for the convenience of all readers. Literature on specific countries, sections, cruises and tours will be gladly sent and we suggest that you fill in the coupon below which is provided for your convenience. The following countries and territories may suggest a trip to interest you:

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6. Holland	17. West Indies	28. Grand Canyon
7. Sweden	18. Holy Land	29. Jasper Park
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These examples indicate that writing is one profession in which age need not be considered a liability. It is an asset. The longer you live, the clearer becomes your understanding of life and human nature . . . and the more you have to say.

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BY IDA RAILEY

I was visiting at my sister's place, and from the other side of the hedge I heard such persistent bird calls that I became curious.

My sister laughed as she said, "Oh, we will go over and meet 'Peeper.'"

Peeper heard us coming, and, a full grown California quail, he stood at the gate to welcome us.

In his eighteen months of life he has never known anything but kindness from human beings, and a new face is a new friend to him. When the nest of eggs hatched Peeper was left behind and the only mother he has ever known is the kindly woman who has loved him and cared for him since the day she found him. There are other quail on the place but his clear, sweet call is not for them. He sits on his owner's hand, his chest thrown out, as he cries, "Come right here, come right here." At night he has a cage to sleep in but in the day he has his freedom and shares the family meals. He eats what he wants, then flies to his owner's lap and goes to sleep.

I was asked if I wanted to see his baby book. A quail with a baby book? Now what could that be? The record was in feathers; the feathers Peeper had dropped as he molted, mounted on a soft, gray background. Little feathers and big feathers, even the black feathers from his crest.

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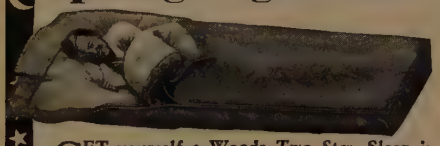

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Chipmunks as Hosts

Wild animals in many of the National Parks are among the most cordial of hosts, having become so through years of protection during which they have regained their confidence in human beings. Here is a Mount Rainier chipmunk, normally a shy and volatile little mammal, as a case in point. He was snapped by Dr. C. F. Eikenbary of Seattle, during a meal of peanuts proffered by Mrs. Eikenbary.

Mystery Tree

This tree near Scarboro Beach, Maine, was several years ago in the path of a fire and apparently is entirely dead. Yet every year this one bunch of leaves has come out and apparently prospered. Where it gets its nourishment is a mystery. The picture was taken by Ruthven Deane.

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About Cactuses

Arizona Cacti is the title given by William Palmer Stockwell and Lucretia Breazeale to the first biological science bulletin published by the University of Arizona. The title is descriptive but we must reserve the right to call them cactuses on the ground that that is the English plural of cactus and we are writing English—or trying to. Seriously, however, this is an excellent guide to the cactuses of Arizona. It is splendid both in text and in the line drawings, photographs and color plates which illustrate the booklet. This bulletin appears to be available from the University of Arizona, Tucson, Arizona, for twenty-five cents. It is worth much more even though you do not happen to be interested in cactuses.

British Grasses

While undoubtedly of somewhat limited interest in the United States, *British Economic Grasses* by Sydney Burr and Dorothy M. Turner has a value to those concerned with agriculture in this country. The book is concerned with identification of the grasses by their leaf anatomy and is illustrated by many plates graphically emphasizing this. It is published in this country by Longmans, Green and Company and sells for $3.75.

Garden Plans

A booklet entitled *Twenty-five Unusual Garden Plans* has been published by the R. M. Kellogg Company, horticulturists of Three Rivers, Michigan. It is an interesting idea and it is ably presented by its author, Romaine B. Ware, whose name is familiar to the readers of Nature Magazine. The plans are carefully worked out to cover about any shape of garden plot, and they should be useful to any gardener starting a new garden or planning to replace the old one. The booklet is sold for one dollar.

Conservation Week

Announcement has been made by Mrs. Charles Cyrus Marshall, president of the National Life Conservation Society, that the annual observances conducted under her auspices during New York Conservation Week, will be held this year on Thursday, April 5. There will be three sessions; morning at eleven, afternoon at 2:15 and evening at 8:15. All sessions will be held at the American Museum of Natural History and will be open to the public. The subject for consideration and as a text for the various speakers will be: "What the Civilian Conservation Corps, inaugurated by President Roosevelt, has accomplished."

Appalachian Trail

The latest publication of the Appalachian Trail Conference deals with the history, route, guidebook data and bibliography of this splendid achievement. It is entitled *The Appalachian Trail* and bears a publication date of January, 1934. Copies are available at twenty-five cents each from the Appalachian Trail Conference, 901 Union Trust Building, Washington, D. C.

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But many of our readers save Nature Magazine or pass it on to others. They dislike to mutilate it by clipping out coupons or advertisements. We appreciate this, so below we are providing a page of coupons and keyed references to advertisements appearing in this and in the previous issues of Nature Magazine. On the back of this page is an advertisement so you will be cutting no editorial text by using this page.

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See Page 155—April issue

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See Page 153—April issue

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England—the daily pageant

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See Page 197—April issue

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Border Flowers

An interesting little booklet for visitors to the Southwest is *A Hundred Flowers of the Mexican Border at El Paso* by Elsie McElroy Slater. The title is adequately descriptive of the subject matter of the 32-page brochure. The author's descriptions are concise yet essentially popular, thus making the booklet of use to the lay flower lover who is not intimately acquainted with the more technical approach of the majority of botanical field books. The little publication is sold by the author at El Paso, Texas, and costs thirty-five cents.

Baked Beans à la Bullsnake

On reading the February number of Nature Magazine I ran across the little article entitled, "A Snake Dinner". Reading this reminds me of an occurrence of a few years ago, which I relate. A premedic student taking a course in comparative anatomy in the Zoology Department took home a few pieces of bullsnake muscle and placed them in the refrigerator to keep until he was ready to use them for study. His mother was away on a visit at this time and the rest of the family were batching, which meant that any raw meat in the refrigerator was relatively safe. When his mother returned he forgot to explain the presence of the meat to her. The family had company for dinner the following evening and a delicious dish of baked beans was served as part of the menu. The son excused himself, after dinner, and started to go to his room to study. He planned to study the bullsnake muscle and on his way upstairs stopped at the refrigerator to get it. He found that the meat was gone. He went to his mother and asked her if she knew what had happened to it, explaining what it was and what he wanted it for. "Why," she replied, "I used that meat to season the beans." Needless to say the company was not informed of the mistake since they had complimented the lady on her dish of baked beans.

More About Herbs

In the recent herb-garden article in Nature Magazine we apparently whetted the appetites, horticulturally speaking, of no few of our readers for herb gardening. We have been asked for further references on that subject. Happily there has just come to hand for review a book entitled *Culinary Herbs and Condiments*. It is the work of M. Grieve, F.R.H.S. There is much history entwined with the story of these herbs, and this, added to the fascination of growing them today, makes the book interesting and apt. It is published by Harcourt, Brace and Company and sells for two dollars.

Nature Stories

Robert Sparks Walker has added another volume to his already considerable collection of Nature works in *Eating Thunder*. This is a group of true Nature stories concerned with the adventures and observations of Dick and his Dad. The book is published by the Association Press, 347 Madison Ave., New York City. The price is $1.75.

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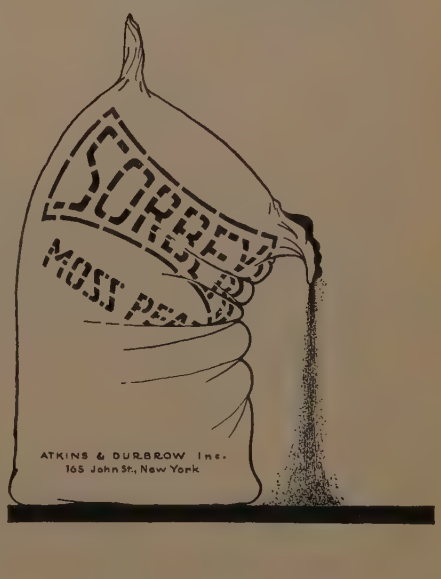

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A Timely Warning

By Ida O'B. Railey

"Jay! Jay! Jay!" The notes fell raucously and startlingly upon my ear. Raucously because only in his own family circle are a jay's notes soft and melodious. Startlingly because the jay was so near the cabin, and it was growing dusk, and he was alone. "Jay! Jay! Jay!" I looked out and in a nearby bush saw him bending down apparently shouting imprecations at something on the ground.

As Margot and I came out of the cabin, with a last shriek, the jay was off. I saw nothing, but Margot's quicker eyes found a coiled rattler abed for the night. Three times that summer the jays warned us of the presence of rattlers.

The vices of the jay are so well known and so often referred to that it is only fair to enumerate his virtues. During the summer a blue jay had a part of his lower bill shot off by a hunter. A domestic fowl so tragically injured would immediately have been attacked by the members of his own flock, but the poor jay continued to stay at the camp, unmolested by the other jays though he was fed more often and more desirable food. At night he went off with the flock and in the morning returned with them. Many summers with the jays have taught us to enjoy their noisy chatter, to appreciate their family virtues, and to heed their warnings.

Watching Polyphemus

"About September last year," writes Harold Mitchell, enthusiastic young amateur entomologist of Oxnard, California, "my aunt gave me a large, pale-green, beautifully colored larva. I had no idea what it was, but fed it on the host plant it was found on. In a month I had the surprise to find that my caterpillar had made himself a cocoon to live in through the winter. In the spring, when it began to get warm, I had the sensation of watching a Polyphemus moth emerge from its winter house. Its wings were light brown, with a transparent spot in each wing. In the lower wings the spots are surrounded by black rings. My advice is, if you find a beautiful, big, pale-green caterpillar, don't kill him for you will miss the thrills that come from raising a polyphemus moth!"

Frogs and Toads

In *Handbook of Frogs and Toads* Anna Allen Wright and Albert Hazen Wright, the latter professor of zoology at Cornell University, fill a gap in the list of handbooks of North American flora and fauna. Here is a book for the teacher, the student and even for the younger naturalist. Excellently illustrated with photographs which show the subjects from a variety of angles and are of real aid in identification, with data on the life habits combined with interesting notes gathered from many sources and with an excellent bibliography and adequate index, this is a valuable contribution to Nature literature. In addition the book has been well printed by the Comstock Publishing Company, Ithaca, New York. It sells for $2.50.

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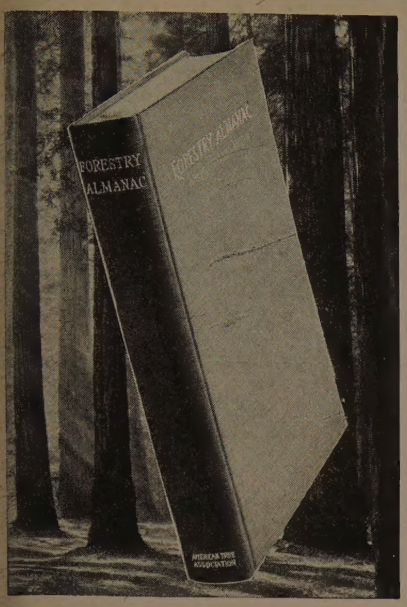

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Yellowstone Data

It is plain that much effort has gone into the preparation of the 144-page mimeographed publication entitled *Scientific Investigations in Yellowstone National Park.* It is the work of Carl P. Russell, field naturalist, and is brought out by the Office of National Parks, Buildings and Reservations (what idiot thought up that name to replace the title of the National Park Service?), of the Department of the Interior. It is essentially a bibliography of published material about this great western wonderland. It is apparent that Mr. Russell regards this immediate work as preliminary and in an accompanying letter asks cooperation in enlarging the list of references. (Since Nature Magazine is overlooked in the present bibliography it is apparent that we have a task to perform.) Such bibliographies may not have wide general use and never economically justify the work spent on them; they are, nevertheless, needed badly when they are needed.

Private Life

By Wilma Isabel Graham

How many of us Americans can see a king today? Not very many, you will say—only those who go to Europe, to some foreign country. A great many of us can see one, if we'd only observe! Just get one of those yellow violets, or Johnnie-Jump-Ups, as some people call them. Pull off the two petals that are above the cup-shaped projection of the flower; pull off the next two petals. There you see the king, in the midst of his private life, washing his feet! He is sitting on his pale gold throne, with a gold crown on his head. He is dressed in green. And he is washing his feet, his spindle-like, yellowish-green legs dangling into a little, green foot tub!

Odd Frogs

Having been much interested in our recent picture of the frog without hind legs, Lord Tavistock of Peasmarsh, Sussex, England, writes that among a number of European tree frogs he bred three years ago there was one with only one eye and another with no eyes at all. He reports that the latter was, perhaps fortuitously, eaten by a robin, but that "Cyclops" is still alive and soon will be full grown. He says, also, that he discovered that very young frogs of this species are for some time wholly unable to swim, and even when they are in water whence an exit seems easy, they have to be watched carefully lest they drown.

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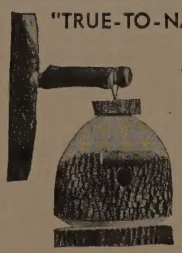

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Until His Arm Hurt

Ben Chapman plays in the outfield for the New York Yankees and has somewhat of a reputation for speed on the bases. He is a good ball player, but it would appear that his sporting instincts end at the end of the ninth inning. In a recent interview he is quoted about his prowess as a hunter as follows: "Shoot mostly for quail and doves. Sometimes an occasional deer. Doves are most plentiful. I shot 900 of them one afternoon. Just kept pumping lead all afternoon until my arm was sore." We do not know just where Mr. Chapman indulged in this wholesale murder so we cannot say whether a warden should be hunting for him with a warrant. However, we are saving up a whole-hearted "boo" for this sportsman when the ball season opens, and it won't be because he goes into second with his spikes in the air, either.

Chappel Award

To James S. Spring, Boston lawyer and sportsman, went the annual Chappel Award for distinguished service to American dogdom. Leadership in the "new deal policy for the forgotten dog fancier" within the ranks of the American Kennel Club, governing body of America's $100,000,000 dog industry, decided the voting, the award committee said. The prize is given every year by the Chappel Kennel Foundation.

Texas Grasses

A monumental piece of work is that done by W. A. Silveus of the University of Texas in his volume entitled *Texas Grasses*. This is a somewhat neglected subject and this work will be welcomed both for its botanical value and its economic importance. The selection of a title is in a sense inappropriate since the grasses covered include practically three-quarters of all those found east of the Rocky Mountains. Back of this volume are years of labor, that is obvious. Its author has accomplished the somewhat difficult task of making his work valuable both to the botanist and agronomist, but useful also to the layman, the farmer and others interested in, or concerned with, grasses. Not the least valuable feature of the book are the 420 illustrations, some photographic and others drawings, which illuminate and aid the text. Mr. Silveus has brought the book out himself, and it may be obtained from the author for five dollars ($5.50 after April 1, 1934). His address is 832 Cambridge Oval, San Antonio, Texas.

Study of Traits

Heredity and Environment is the title given to a new volume on a fascinating subject by Gladys C. Schwesinger. It is an analysis of the mental traits of man and is the first attempt to assemble the scientific evidence which has accrued, largely within the last decade. To the layman it offers in readable form a picture of recent scientific studies of human traits, fascinating for the light which they throw on an age-old problem. To the scientist it is a compendium of studies, and its extensive bibliographies make it an invaluable reference work. The volume is published by the Macmillan Company and sells for four dollars.

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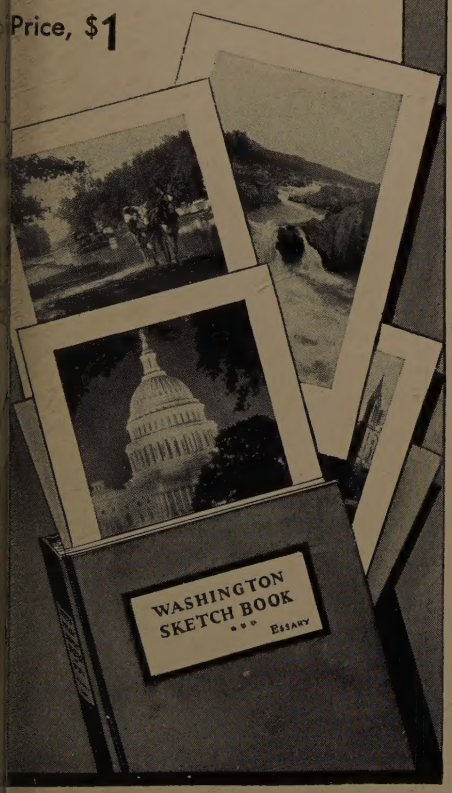

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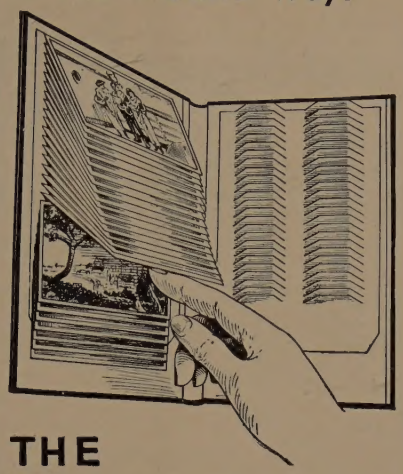

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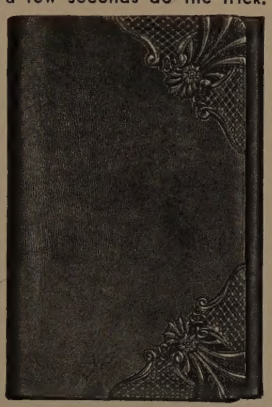

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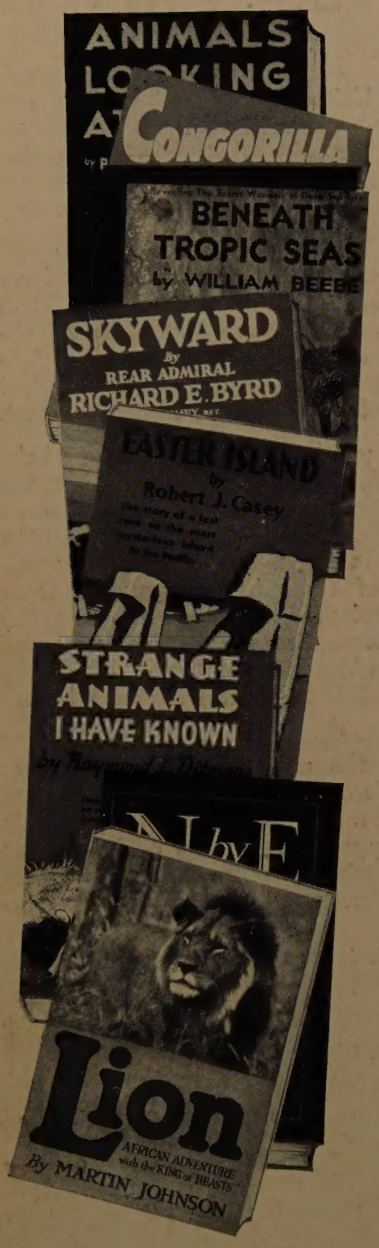

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